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An Address.¹

By G. MONCRIEFF BARRON,
Sydney.

THEY say "the thoughts of youth are long, long thoughts", and if young people think for themselves, why should they listen to the veteran? I should say, not because his thinking is necessarily any wiser than theirs, but because it is, or should be, mellowed by experience. Being qualified by a long experience, perhaps I may offer you some thoughts on the profession you have chosen. But I bear in mind that medical writers, and so possibly medical talkers, used to be divided into two classes, those who thought they had something to say, and those who thought they had to say something.

In your studies you have learnt a great deal of science. Experience will persuade you that medicine is also and no less essentially an art. However, as a science, medicine is science at its best. In the new age of atomic forces scientific achievement will not, I think, inspire that simple idealistic enthusiasm it knew in earlier times. Science then seemed a kind of revelation of many mysteries of the universe; but now people begin to feel wary of a power that might be able to destroy the world. Not so with medical science. If it continues true to its ancient ideal—and that will rest with you, its young practitioners—science as practised by the good physician and by his helper the nurse will be healing always, destructive never.

Medicine must be an art, because the doctor deals not only with the things that can be studied in the laboratory, but with the living body, with personalities and with human relationships. He must be able to understand his

fellow beings, whose illnesses often are an expression of the emotional stresses of living. He cannot do this with a narrow mind. His own personality must not be inferior to that of the general run of his patients. So it is that the great doctors of the modern world have been men of rich personality and liberal culture. Here I should like to read you a few words of Sir William Osler's:⁽¹⁾

Professional work of any sort tends to narrow the mind, to limit the point of view and to put a *halmark* on a man of a most unmistakable kind. . . . Like art, medicine is an exacting mistress, and in the pursuit of one of the scientific branches, sometimes, too, in practice, not a portion of a man's spirit may be left free from other distractions, but this does not often happen. On account of the intimate, personal nature of his work, the medical man, perhaps more than any other man, needs that higher education of which Plato speaks—"that education is virtue from youth upwards which enables a man eagerly to pursue the ideal perfection".

The more specialties in medicine, the more need the doctor has of the cultural and other interests which prevent narrowness of outlook, and without which he cannot be abreast of his time.

Robert Louis Stevenson in his youth was a medical student. Since he was notable for his sense of character, his view of the medical profession is interesting. The physician, he says, if he holds to the ethical ideal, which includes proficiency in the art, shares as little as any in the defects of a period and most notably displays the virtues of the race.

Generosity he has, such as is possible to those who practise an art, never to those who drive a trade; discretion tested by a hundred secrets; tact tried in a thousand embarrassments; and, what are more important, Herculean cheerfulness and courage. So it is that he brings air and cheer into the sickroom and often enough, though not as often as he wishes, brings healing.

¹ Delivered at the registration of medical graduates by the New South Wales Medical Board on October 2, 1946.

That phrase, "discretion tested by a hundred secrets", indicates that the doctor's avocation is unlike most others in one important respect. It is in his relationship, usually intimate and confidential, with those who employ him. He is entitled to be paid for his work. But beyond that, he feels a responsibility towards his patient, an interest in his welfare, which are not merely proportionate to what he is paid, but are enjoined upon him by his professional ideal. If this principle is ever discarded, medicine will be entitled to the status only of a skilled trade.

In one aspect then medicine is an art. And I think I may illustrate this by glancing at a celebrated practitioner of one of the fine arts. That great French painter, Degas, might take a commission for a picture—might be employed, that is, by somebody to do a piece of work. But when the picture was painted and paid for, he would not lose interest in it and simply go on to something else. Indeed, his interest in the work remained so keen that sometimes he would contrive to buy it back. He worked in the spirit of the artist. Now, if the worker was in a trade, and if the work commissioned was a pair of shoes, even the worthiest tradesman would cease to be interested in the job once he had finished it and been paid. But the good physician has this in common with the artist, that he puts himself into his work, and how far he does so is governed by nothing but his professional conscience.

In spite of all social changes, the doctor, if people feel that he holds to the ancient professional ideal expressed in the Hippocratic oath, still enjoys considerable status and prestige. This is accorded not merely because of his learning in his craft, for today persons in various other vocations possess equivalent technical knowledge and skill. One reason is that he works hard, and in the average case for a moderate reward. Another reason is that he seems strong and dependable in situations where others may feel grieved and helpless. Therefore they must put trust in his integrity of character. And in a society where "pressure groups" foment intolerance, the doctor, having an intimate and confidential relationship with persons in every class and group, still tries to preserve a sympathetic and tolerant attitude to all. This desirable quality in the doctor has been well expressed by Lord Horder.⁽²⁾

It is part of his job to surrender to some extent his private feelings in order that he shall become the man whom all men can trust outside the strife—the life-man, not the death-man, the peace-man and not the battle-man. . . . Only in this way will he be regarded in the light which he surely desires—as an expert who should be consulted when matters of the Common Health are under discussion, and who should be feared on account of his power against legislation which, however useful to the opportunist in political affairs, is inimical to the public interest.

You will perhaps expect me, as one of the former presidents of the New South Wales Branch, to say a word or two about the British Medical Association. It has often been described, or denounced, as "the most powerful trade union in the world". As to that, if it is correct, why should it be objected to in this country, where trade unionism is highly orthodox and accounted righteous? However, the association differs in various ways from the ordinary trade unions. To begin with, it is a union whose members nearly all are self-employers. Another difference is that no doctor is obliged to join it. The membership of its governing council is chosen by regular election and is constantly changing. And it is largely occupied with questions of medical ethics, with the maintenance of a high standard of professional conduct—that is, with the interests not only of its members, but of its members' employers. Incidentally, one may ask whether any trade union is known to produce a union paper comparable to the *British Medical Journal*.

If the young doctor is curious to hear the views of the veteran on any subject, that subject is, I suppose, medical ethics. What have been the ethical problems, and how were they dealt with? I have no wish to offer you a lecture on the principles of medical ethics, for the principles themselves are not hard to learn. But how to apply them—especially when the doctor is under tempta-

tion, as often enough he is? I prefer to relate an experience of a colleague of mine.

He had not been long in practice when a woman who lived in a distant country town came to his surgery in a Sydney suburb. She was newly married and she was pregnant. Neither she nor her husband wanted a child, as she said, so early in their married life. Would the doctor help her? No, he would not. He knew of no valid reason for interruption of pregnancy. So the woman tempted him with the offer of money. Her husband had plenty of money. And it was tempting; the young doctor was poor. Two hundred pounds. . . . three hundred pounds. However, he was firm about it. He advised her to go home and have her baby. Curiously, he made an impression on her. She did go home. And later she came to see him, and it was to ask him to confine her. He did so. As the years went by she had three more children, each of whom he helped into the world.

You may feel that this is a very moral story; yet it is true. Eventually he earned as much from this patient as she had offered him in the first place. But the way of it was more satisfying to both of them. At their first meeting the young doctor followed the principles of the Hippocratic oath, more especially two of them. He abstained from something the ethical code forbids. And he kept her secret. In the words attributed to the Father of Medicine:

Into whatever houses I enter, I will go into them for the benefit of the sick, and will abstain from every voluntary act of mischief and corruption. . . . Whatever, in connection with my professional practice, or not in connection with it, I see or hear, in the life of men, which ought not to be spoken of abroad, I will not divulge, as reckoning that all such should be kept secret.

References.

- ⁽¹⁾ W. Osler: "The Master Word in Medicine."
⁽²⁾ Lord Horder: "The Approach to Medicine", *The Lancet*, Volume I, 1939, pages 914 and 915.

PEPTIC ULCER.

By LEO DOYLE, M.S. (Melbourne), F.R.A.C.S.,
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PEPTIC ULCERS are always with us, presenting an elusive, worrying and difficult problem. This is made evident by the number of articles on the subject constantly appearing in the various journals. Other abdominal disease, such as carcinoma, acute inflammation, intestinal obstruction et cetera, generally presents a clinical picture whose aetiology, varying pathological types and stages are more or less understood; but in peptic ulcer we have a disease for which we have as yet no completely satisfactory explanation. The facts are known well enough to every surgeon of experience, and so I shall not burden this essay with more clinical histories than may be necessary to illustrate a point.

It is customary for anyone attempting to prove a theory to substantiate his statements with lists of cases and statistics. I cannot do this, because the number of cases falling to the lot of any one person is so small as to be statistically valueless—or at least, it is so in my practice. I propose to discuss facts already known, and to show that they are capable of explanation by an hypothesis which has been advanced before, but which has never received the attention that I feel it deserves.

Nowadays, it is conventional to doubt the truth of any hypothesis that cannot be proved scientifically. This pseudo-correct attitude may obstruct progress in medicine in some degree, as complete scientific proof is not always available and is frequently not possible, whilst clinical evidence is always available. Medicine is not yet an exact science, and we should be careful of believing that it is. In this connexion the late Wilfred Trotter, of University College Hospital, said that "the affectation of scientific exactitude in circumstances where it has no meaning is perhaps the fallacy to which medicine is most exposed". The same

writer also stated that "the exactitudes of science call for the elimination of the human faculty as far as possible and the lack of exactitude in the practical art calls for the use and expression of the human faculty as far as possible".

I make reference to these statements in an attempt to *disarm those who may object* that much of what I have to say is unproven. Scientific proof is here extremely difficult. Investigators everywhere have exhaustively examined the gastric secretions; they have placed foreign organs in the stomach, and they have connected and disconnected the alimentary tubes in all sorts of ways. The net result of much of this painstaking work has not proved scientifically a great deal, but has provided a mass of circumstantial evidence which is extremely useful.

In this essay I propose to call attention to much that is common knowledge, as well as to some facts that have appeared in recent journals, and with this material I shall try to revise some of our present-day interpretations and eventually to establish a fresh conclusion. I hope to establish a theory of causation that fits the known facts better than most present-day theories, which in my opinion do not provide a reasonable explanation.

Aetiology of Peptic Ulcer.

Despite many years of inquiry, the cause of gastric ulcer still remains more or less a subject for conjecture. The stomach is a deeply placed, interior organ, and this makes investigation of its behaviour and mechanism rather difficult for the investigator and irksome for the patient, since it may involve the insertion of a yard of metal or rubber down the gullet, or investigation by X rays, which if too protracted and frequent can cause a patient much discomfort. The result is that the aetiology of gastric ulcer cannot be arrived at directly. Rosenthal⁽¹⁾ gives a list of the causes of gastric ulcer, including such diverse conditions as excessive acidity and digestive action of trypsin, the disturbance of hypophyseal action, disturbance of the acid-base ratio of the blood and spastic contractions of the mucosal vessels.

The embolic theory of Virchow, Hauser and von Bergman is a fanciful idea which has had a considerable vogue and has been responsible for a large amount of unnecessary surgery, both dental and abdominal. How often are we told by patients that the first treatment ordered for their digestive troubles was to have their teeth extracted—the good being sacrificed with the bad, whose guilt was often a matter of presumption only? This theory prettily supposes a convenient "septic focus" dropping infected emboli into the blood stream, these rushing immediately to the stomach mucosa and always lodging squarely on the lesser curvature. So truly must they hit the lesser curvature that, if they miss and lodge on the greater curvature the ulcer promptly becomes a carcinoma. These emboli never affect the skin, the eye, the tongue, nor any other organ, damage to which would be immediately noticed by the patient. The theory also fails to account for the fact that many patients with a gastric ulcer have no demonstrable septic focus. This inconvenient fact is bypassed by predication of the infected state of an invisible organ and blaming it. In this respect the organs most frequently denounced as infected are the appendix and the gall-bladder. Because the removal of one or other or both of these organs is frequently followed by a temporary improvement, the causal relationship is regarded as proven—an unjustifiable conclusion, because after a period of bed rest nearly every dyspeptic improves to some extent. That this apparent improvement is not real has been demonstrated many times by the radiologist. The ease with which the appendix may be blamed and the evidence of its guilt removed leads to unnecessary operations and occasionally to the giving of incorrect advice to the patient. I recently had the greatest difficulty in removing a large duodenal ulcer from a patient who had been informed three months previously, after an appendicectomy performed through a muscle-splitting incision, that his duodenum was not diseased. Strangely, I have never heard of the prostate being blamed as the site of the septic focus, although it is an organ that frequently carries a demon-

strable infection—an infection that can usually be cleared up by the simple but inelegant and inexpensive process of massage *per rectum*.

The next theory that gastric ulcer is due to over-secretion of hydrochloric acid is more or less generally accepted. Excessive secretion of acid does occur and does produce its effect; but it will be my intention to show that this hypersecretion is the result, and not the cause, of structural changes in the stomach mucosa, and that it is only accidentally a source of further changes in that membrane.

Much work has been done in an endeavour to discover how a substance normally present in the stomach can produce changes in its structure, and many interesting facts have been elicited.

Büchner⁽²⁾ (quoted by Lindau and Wulff) has subdivided the "gastric system" (Aschoff) into four zones containing different types of glands. These are as follows: (i) a narrow band (1.5 centimetres) of cardiac glands; (ii) a much larger zone of fundic glands containing chiefly parietal cells, which is the sole source of hydrochloric acid; (iii) a zone of pyloric glands, which reaches higher on the lesser curvature than on the greater; these glands secrete a slightly alkaline or neutral mucus and are stimulated by food; they exercise a regulatory action on the production of gastric juice from the fundus; (iv) the duodenal type mucous membrane, which changes character to small intestinal type proximal to the entrance of the bile duct. Büchner's theory based on these facts is that ulcers arise in the area of activity of the gastric juice, whereas the area of its production possesses by nature a relatively high power of resistance, this accounting for the frequency of ulcer in the antrum. This theory will account for the ulcer, but not for the excess of secretion.

Dragstedt⁽³⁾ in an exceedingly valuable and informative paper, makes some interesting observations on the effect of hydrochloric acid on normal tissues. He has quoted Hunter as stating that all living uninjured cells could withstand the action of the gastric juice. Segments of bowel (duodenum, jejunum, ileum, colon) can be successfully transplanted into a stomach defect, and if the blood supply of the transplanted tissue is not interfered with, no ulceration takes place; in fact, the procedure has been stated to cure ulcer (Andrus, Lord and Stefko⁽⁴⁾), but confirmation of the original statement could not be found (Kolouch, Dubus and Wangensteen⁽⁵⁾, Grossman, Dutton and Ivy⁽⁶⁾). If an organ such as a pancreas, spleen or kidney is transplanted, not only will it not be digested away, but in time it will be covered by a layer of gastric mucous membrane. Hunter later makes the statement that pure gastric juice will destroy and digest all living tissue including the wall of the stomach; but this does not occur in life, as the pure gastric juice is constantly being diluted by saliva, by alkaline secretions from the antral area, by regurgitated duodenal juices, and by food. He then states that excessive secretion of qualitatively normal juice will produce an ulcer in the stomach and duodenum of the lower animals. Later, Dragstedt states that patients with ulcer secrete more juice in response to food than is normal, and what is more important, they secrete more when there is no obvious stimulus to secretion. Later on Dragstedt quotes the histamine ulcers of Walpole, Varco, Cole and Wangensteen, and speculates whether the histamine produced by an allergic reaction may not have an effect on the incidence of ulcer.

A factor that has helped to establish hydrochloric acid as the causative factor in peptic ulcer is the ease with which the amount may be measured and shown to be excessive. An interesting observation is that of Schriffrin and Ivy⁽⁷⁾ who state that of itself hydrochloric acid will not produce an ulcer—the presence of pepsin is necessary. Pepsin has not been studied to the same extent as hydrochloric acid because of the difficulty involved. However, this observation is not so important as it sounds at first, because St. John, Flood and Gius⁽⁸⁾ state there is a proportionality between the amount of hydrochloric acid and that of pepsin present in the juice of excised stomachs. Neumann⁽⁹⁾ quoted by St. John, states that pepsin is absent or present only in traces in antacid stomachs.

This, of course, is to be expected, for it is difficult to see how a stomach could selectively secrete varying quantities of pepsin and acid. The inference is that we should seek a cause that is capable of making the stomach secrete, in excessive quantity, juice of normal quality.

Cushing⁽¹⁰⁾ has suggested that lesions of the mid-brain may be responsible for the production of oversecretion and consequent ulcer, and has reported a case in which gastric ulcer followed an operation for a cerebellar tumour. Clinical proof that a nervous origin is probable is the fact that peptic ulcer is a common lesion in young men suffering from nervous tension for any reason. Support for this view can be found in the increased number of gastric disorders that have occurred since the outbreak of the war. However, I think that this can be explained, and I have made an attempt to do so later in this paper. Dragstedt and Schafer⁽¹¹⁾ advance the theory that the hypersecretion of acid is largely neurogenic in character; they have treated the condition by dividing both vagus nerves before they reach the stomach. This is said to produce a pronounced and long-continued decrease in the total acidity. An incomplete division had little or no effect. Several patients have been treated in this way and good results are claimed.

As may be seen, there is much ground for the opinion that hyperacidity is the cause of ulcer. I believe that the danger of this idea lies in the failure to seek the cause of the hyperacidity, and so therapeutic measures are designed to combat hyperacidity alone. Thus we have the everlasting prescription of alkalis. The immediate relief and apparent temporary success of this prescription have conferred, I think, the greatest benefit on the manufacturing chemists, who have created many marvellous compounds—alkalis, antacids and adsorbents. These different compounds are “boomed” for a while, reach the pinnacle of fame when someone writes an article quoting numerous cures, and finally, after much use, descend and reach their level as a unit in the alkaline powder prescription of which we are so fond. A newer and effective method of antacid treatment is to introduce the alkalis into the stomach directly by means of a Levine or similar tube. The alkali is introduced continuously, and so is enabled to neutralize the acid produced when the stomach is resting.

Treatment based on this theory does nothing about the underlying condition responsible for the hypersecretion and consequent ulcer, and so allows the ulcer to become chronic and liable to all complications associated with chronicity. It is also possible that the ingestion of the large quantity of alkali with acid neutralization may lead to the blood's losing much of its acid reserve, and so create a state of alkalois with its attendant troubles.

Characteristic of ulcer is a long history of dyspepsia with many intermissions. The intermissions are sometimes seasonal (cold weather being often associated with an increase of symptoms), sometimes due to nervous upsets and worry (financial and conjugal trouble the commonest), and sometimes due to dietary or alcoholic indiscretions. Anxiety or worry, if sufficiently grave, is capable of producing an attack of severe indigestion in people otherwise healthy. One concludes that any cause of peptic ulcer must be capable of lasting over the years, its effects varying from time to time in a particular person or in different persons for reasons which are at present unknown.

All theories agree that peptic ulceration follows damage to, and subsequent digestion of, an area of diminished resistance. Whence comes this area of lessened resistance? The infarction theory provided it very neatly; but the protagonists of the hyperacidity theory, whilst agreeing that the area must be there, do not suggest how it comes about. Recent work by Schindler⁽¹²⁾ and others with the gastroscopist has shown that gastritis is a frequent lesion of the stomach, and that nearly every ulcer has an associated area of gastritis. The radiologist frequently sees the thickened rugae of gastritis in patients with and without an ulcer. These facts provide an interesting commentary on the value of current medical teaching, for as a student I can remember being taught that gastritis as

a lesion did not exist and that it was diagnosed only by the mentally destitute. The disease does exist—the X rays have shown it and the gastroscopist has seen it. Ringertz⁽¹³⁾ studying gastrectomy specimens has found it a constant associate of peptic ulcer, and has described the microscopic changes present. He states that varying degrees of gastritis present in different cases probably correspond to the phase (exacerbation or remission) at which the gastrectomy was performed. Lindau and Wulf⁽¹⁴⁾ state that these changes are not merely secondary conditions of irritation in the tissues surrounding the ulcer, and this is shown by the fact that they are uniformly distributed over the entire pyloric end irrespective of the site of the ulcer, and by the fact that this type of gastritis also occurs in cases in which no ulcer is present.

These statements agree with my own experience. I have recently had sections made from all resected stomachs. In all the usual signs of gastritis have been found, the microscopic appearances being the same whether the stomach is the site of an ulcer or is not the site of an ulcer. The changes are spread along the lesser curvature and the antrum and are apparently of varying intensity in different points. The gastritis present varies in intensity from acute to atrophic, probably according to the length of time during which it has existed. The more long-standing the gastritis, the more will round cells in the submucosa accumulate, and the more will the mucous lining degenerate, until eventually it loses its convolutions and becomes a low membrane.

In view of these facts I think one is entitled to state that a peptic ulcer is almost invariably associated with gastritis, and with this in mind I shall now take a few clinical facts that are well known to all and see if we can advance to a better understanding of the problem. There is a large number of patients who have all the signs and symptoms of ulcer, in whom the X rays can demonstrate no ulcer, but in whom the radiological appearances of gastritis are present. It may be that when I acquire more clinical experience I shall also be able to predict definitely the presence of an uncomplicated ulcer, but I doubt it. Any shrewd physician can tell when the ulcer has penetrated from the stomach into an area containing pain-sensitive nerves, because the story is then altered, and the patient, who has hitherto had only cyclical discomfort, now has not only this but also constant pain.

How many times have we had a skiagram taken to see the existing state of affairs in a patient who has undergone treatment for a proven ulcer, and been surprised to see that, although he is feeling well and has no pain, the ulcer is still unhealed? If these facts are considered—namely, absence of ulcer in cases of typical pain and its presence when there is no pain—they lead to the conclusion that an ulcer does not cause pain until it is complicated.

In summary, the radiological examination of a patient whose history of dyspepsia is definite may reveal an ulcer or it may not. Patients with a radiologically proven ulcer, who are radiologically examined again after a period of treatment which has been clinically completely satisfactory, inasmuch as they are free from pain, are found still to have an ulcer; so ulcer may be absent in cases of typical pain and present when there is no pain.

If this can be accepted, it leads us to the next step—the theory that peptic ulceration is but a complication of an already existing gastritis, and of itself has no importance until it becomes complicated in any of the usual ways.

One or two clinical histories may now be useful.

A middle-aged man, who had been treated for dyspepsia for many years and had been radiologically examined several times without an ulcer being demonstrated, was admitted to hospital complaining that now his pain had become so severe that he could no longer work. He had the congested “alcoholic” complexion that is so characteristic of gastritis but not necessarily of alcoholism. A recent series of X-ray films revealed no ulcer. At operation a “pink stomach” was found, and subtotal gastrectomy was performed. It produced an immediate change—so much so that in ten days he felt different, as he no longer had any pain. He also looked different—the florid complexion so characteristic of gastritis had disappeared completely. Macroscopic

examination of the stomach revealed atrophic gastritis without any demonstrable ulcer or ulcer scar.

I am sure that if the condition had been left, the patient would have continued to suffer until, having developed an ulcer and having had it demonstrated by the radiographer, he underwent a gastrectomy with consequent relief. When examined at a later date, the patient said that he was doing a twelve-hour shift in a munition factory and was feeling well.

Another patient of interest now is a middle-aged man, who after a long history of pain, underwent a resultless laparotomy. On leaving hospital he continued to suffer for some years and underwent another laparotomy, at which a gastro-enterostomy was performed. He was well for a while, but again began to suffer, and this time free haemorrhage occurred. I first examined him after he had recovered from a severe haemorrhage. With the idea of excising his ulcer I opened the abdomen, but found no ulcer of any sort. A gastrectomy was performed; the portion of the stomach that lay distal to the gastro-enterostomy was excised and use was made of the existing stoma. He announced that his abdomen now felt different and that he was without pain. Examination of the excised stomach removed revealed atrophic gastritis.

The fact that these two—the man who never had an ulcer, and the man who should have had an ulcer to account for his haemorrhage—obtained relief after gastrectomy, proves that in some cases at least the typical ulcer pain can exist without an ulcer and can be relieved by the removal of the stomach. The second case may be an example of what I now believe to be not infrequent—namely, severe haemorrhage occurring from gastritis without ulceration.

The Mechanism of Ulcer Formation.

The mucosa on the lesser curvature, being most firmly fixed to the underlying muscle, cannot slide away and is apt to be eroded by any solid food particles ground up against it by the strongly contracting muscle of the antrum. Schindler⁽¹⁶⁾ states that mucosal haemorrhages in normal mucosa are more common in an ulcer-bearing stomach than in a normal stomach. Again, small ecchymoses are characteristic of an allergic reaction. Needless to say, areas like these (scratched or ecchymotic) easily provide an area of diminished resistance. In addition to these facts, increased contractility of the muscles due to the presence of increased acid secretion is also present. The soft, fixed mucosa or the ecchymoses may be responsible for the mucosal break; but once this occurs the digestive juices will continue the process, and owing to the gastritis, the normal healing power of the stomach will be diminished. This allows the ulcer to form, and it may become chronic if the process lasts long enough. Gastritis begins as acute, or perhaps more frequently subacute, inflammation with swollen hyperemic mucosa and associated excess of the normal secretory products, and passes through the various stages of chronicity to atrophy, the low mucous membrane being free of rugae and having a very little secretion; in its progress gastritis will also certainly at some time or another be associated with a break in the mucous membrane and possible ulcer, which becomes chronic, heals and breaks down again, according as the gastritis, influenced by the varying factors controlling it (cold, worry, diet), flares up and dies down again from time to time. Faber⁽¹⁷⁾ in his book on "Gastritis and its Consequences" has many illustrations of the microscopic anatomy of the various stages of gastritis, most of which have been obtained from stomachs removed for ulcer. Schindler⁽¹⁸⁾ found atrophic gastritis in 17 out of 79 ulcer-bearing stomachs.

In my opinion, this conception of ulcer as purely and simply a complication of gastritis will account for some otherwise inexplicable phenomena.

If one regards the symptoms (I do not mean those due to any complications such as penetration, stenosis *et cetera*) as being due to the gastritis and not to the ulcer, one immediately has an explanation of how the radiological appearances frequently conflict with the clinical state of the patient—for example, the persistence of symptoms in the absence of radiological demonstration of the existence

of an ulcer, and contrariwise, despite the patient's statement that he is well and has no pain, the visual demonstration of an ulcer. It also accounts for the existence of multiple ulceration. There is also an explanation for Dragstedt's⁽¹⁹⁾ statement that patients with ulcer secrete more acid than normal patients, and for the fact that the relative acidity may approach but will not pass that of pure normal juice.

Gastritis is a much better explanation of excess acidity than excess acidity is of gastric ulceration. The excess acidity exists before any ulcer is found and after it has been seen. The explanation is simple—the inflamed and therefore congested mucosa secretes, owing to the hyperemia, an excess of what it normally secretes. It not only produces gastric juice in response to the ordinary stimuli, but it also produces gastric juice when the stomach is empty, and so the juice is one of high acidity because it is undiluted.

This explanation does not suggest that a normal organ is behaving abnormally, as do those who specify excess acidity in an otherwise normal stomach. It simply states that the stomach behaves as other secreting membranes do. If this is so, then the juice secreted should be merely an excess of the normal secretion containing both pepsin and hydrochloric acid. Wangenstein and Lannin⁽²⁰⁾ and Schirrfrin and Ivy⁽²¹⁾ state that gastric ulcer is due to oversecretion of gastric juice. Schirrfrin and Ivy⁽²²⁾ state that there is a tendency for gastric acidity to diminish as an ulcer diminishes. Read "gastritis" for "ulcer" and this is reasonable. That an inflamed secretory membrane will produce more of its secretion than a normal membrane is a frequently observed phenomenon (coryza and hay fever), and so it is more reasonable to expect that inflamed gastric mucosa will secrete an excess quantity of normal juice than to expect that normal mucosa will manufacture a secretion abnormal in quantity or quality.

Wangensteen and Lannin⁽²³⁾ state that their associates, Code and Varco, have produced typical gastric ulcers by forcing continuous secretion of gastric juice. This was done by putting a mixture of histamine and beeswax into the muscles of laboratory dogs. The continuous absorption of the histamine provided a stimulus that kept the stomach continuously secreting.

Summary.

Let us summarize the arguments adduced so far:

1. Existing theories of causation are not satisfactory.
2. Uncomplicated ulcer may cause pain. Uncomplicated gastritis can cause a typical ulcer syndrome.
3. Ulcer is associated with a gastritis which is capable of causing pain.
4. It is reasonable to assume that (a) gastritis is associated with an increased secretion of gastric juice, (b) the mechanism governing the secretion is out of gear, and secretion takes place constantly.

5. The combination of inflamed and therefore weakened mucosa with an excess of peptic juice needs only some trauma to break the mucosa, and the stage is set for the formation of an ulcer.

Aetiology of the Gastritis.

At this stage it becomes necessary to establish a cause for the gastritis before any further progress can be made. Rosenthal⁽²⁴⁾ states that formerly gastritis was thought to be rare, but that more accurate diagnosis has shown it to be common.

Faber⁽²⁵⁾ states that the interest in gastritis started afresh ten years ago and was largely stimulated by the work of Konjetzny, who studied the stomachs removed after operation in cases of peptic ulcer. Further proof came from the work of Schindler and his followers with the gastroscope. Devine⁽²⁶⁾ states that he has frequently operated on patients who had symptoms characteristic of ulcer, but who had no ulcer, only demonstrable gastritis. Many of these patients in time developed an ulcer requiring resection. Devine then states that he believes the gastritis and the ulcer both to be due to the effects of hyperacidity.

As was said before, the inaccessibility of the stomach and the difficulty of adequate methods of investigation force

us to make use mainly of circumstantial evidence in endeavouring to ascertain the cause of disease in this organ.

Rosenthal⁽²⁶⁾ gives, as the cause of gastritis, dietary abuses, excessive consumption of iced and hot food, over-spiced dishes, habitual use of toxic substances such as nicotine, alcohol and coffee. He then states that recently there has been some evidence to support the possibility of an allergic origin, but adds that this type is paroxysmal in nature and short in duration. He also states that continued excitement, fatigue, and a strenuous, disquieting life do their share. Anyone familiar with allergy will recognize that these are just the conditions to make a sensitive patient respond to a nominal dose of his allergen.

Konjetzny⁽²⁷⁾ and his collaborators attribute the changes to ordinary gastritis produced by mechanical, thermal and chemical irritants, while bacterial aetiology is thought not to come into the condition. Of interest is the fact that they totally deny the possibility that the acid gastric juice is the primary causal factor, and regard the current designation of peptic ulcer as being misleading and erroneous.

These two sets of workers are agreed in principle, if not in detail, that what are ordinarily regarded as stomach irritants will cause gastritis. However, they ignore the fact that most dyspeptics, after a little experience, will not eat this kind of food. Alcohol alone seems to be an exception. In this connexion a recent article by Berry,⁽²⁸⁾ summarized in the *British Medical Journal* of May 9, 1942, makes interesting reading. One hundred well-developed chronic alcoholics of ten to fifteen years' standing, of whom 90% were heavy smokers, were the subjects of an investigation. Of these, 84 had no post-prandial distress—they apparently tried hard to deserve it by taking all sorts of condiments on baked and fried meat. Their only digestive symptoms were some morning nausea, which was relieved by the consumption of further alcohol. The gastroscope revealed only slight changes or none at all in the mucosa. A higher incidence of true gastritis was found in a further sixteen subjects, who drank actually less alcohol than the others. All these had some digestive symptoms, mainly general abdominal discomfort and fullness with occasional vomiting and nausea. Berry concluded by stating that in one hundred undoubtedly cases of chronic alcoholism, in only 35 was unequivocal chronic gastritis present.

One conclusion drawn from these studies is that persistent heavy drinking is compatible with a healthy gastric mucosa. A second conclusion that appears to be justified is that, in the production of chronic gastritis in an alcoholic person, alcohol itself is not the only factor.

Most dyspeptics avoid hot spiced food, sauces *et cetera*. To my mind a much more probable explanation of the gastritis is that the stomach is unable to accommodate some of the more usual types of food—in other words, that it is sensitive to them. It is possible to imagine a patient who has a stomach allergic to some simple article of food, and in taking this does more harm to his stomach than taking, for example, hot Worcestershire sauce. It is grudgingly admitted that allergy may be a cause of gastritis. We know for a certainty that the nose, bronchi and skin are sensitive and react to different substances; why should not the stomach be exactly the same?

Kennedy,⁽²⁹⁾ in an article on various aspects of food allergy, states that gastro-intestinal symptoms are amongst the commonest manifestations of food allergy and are liable to misinterpretation unless one keeps the condition in mind. He states that surgical operations on such patients are not uncommon and, of course, give no relief. Symptoms maybe gastric or intestinal or both. Acute or chronic, mild or severe, they may simulate gastric or duodenal ulcer, acute or chronic appendicitis *et cetera*. He further states that mild allergic reactions to different foods may produce slight but recurring abdominal symptoms, the true nature of which may be overlooked because of this mildness. He gives clinical histories of patients suffering from ulcer relieved by allergic treatment. An observation by Wangenstein and Lannin⁽³⁰⁾ becomes appreciated at this moment.

A patient had undergone the operation of exclusion gastrectomy, which left portion of the antrum. The excised portion of the antrum was examined microscopically and found to be the seat of gastritis. The patient developed further symptoms, and as treatment had the residual segment removed with subsequent cure. Microscopic examination of this previously inflamed structure now showed that the original gastritis had disappeared. No food passed over this part of the gastric mucosa, and it recovered from its inflammation.

If this view of the aetiology of gastritis and its consequent ulcer is accepted—namely, that it is due to the effects of food which is not necessarily of the irritant type, but may be of the simplest and most bland kind on the gastric mucosa—then the treatment of these two conditions becomes simple. Furthermore, a hope of cure can be offered to a patient who is willing to cooperate. It may be stated that this is done nowadays. True, a patient not having a milk-sensitive stomach will recover if he is put on a full milk diet and avoids all his other food (including the allergen). But should he have the ill fortune to possess a milk-sensitive stomach, the only relief he will get will be when he breaks his diet and has a meal of meat, vegetables *et cetera*.

One may now quote the case of a trained nurse, who had suffered for years from a duodenal ulcer. She had had several sessions of bed treatment with various ulcer diets, but continued having symptoms. Finally she was advised to give up her customary diet and to eat some meat and vegetables. This she did, and she has remained well since. She has since admitted that previously the only comfort she had was when she broke her diet and had a meal of steak and onions.

Another case of interest is that of a man, aged forty-two years, who had for years suffered from dyspepsia of the duodenal ulcer type and had lived on the usual milky diet of the dyspeptic. He grew stout, and after being examined medically and found to be a diabetic, he decided to diet himself. He ate meat and vegetables only, and to his gratification found that not only did he lose weight but also his indigestion.

Kennedy⁽²⁹⁾ states that "it is surprising, but true, that the foods most frequently causing allergic reactions are the common, everyday ones—eggs, milk, wheat and potatoes". With these facts in mind, it is easy to see that food sensitivity is a most likely cause of gastritis.

To summarize now:

1. Allergy is suggested as a probable cause of gastritis.
2. It has been shown that excessive alcoholism is not necessarily a cause of gastritis.
3. It has been shown that an ulcer may persist whilst the usual ulcer diet is taken, and may disappear when the diet taken is at variance with the usual dietary principles.
4. It is stated that the most frequent allergic antigens are articles commonly used in ulcer diets.
5. It is suggested now that food sensitivity is a most likely cause of gastritis.

Now let us carry on from here and consider that the effects of allergic sensitivity are due to a chemical interaction between two substances. Such an interaction is governed by the laws governing all chemical actions, one of which states that the intensity of action is proportionate to the concentration of the interacting molecules and to the length of time for which they are in contact. This being so, the most intense reactions should occur in the sites where the food stays longest or where it is most intimately in contact with the mucosa. We can easily believe, on general principles alone, that the more intense the stimulus, the more active will be the tissue response. Further, the more the response, the more the affected part will be inflamed and swollen and so apt to suffer as the result of trauma and lowered resistance. Characteristic of the allergic response is the liberation of histamine or a histamine-like substance, and the injection of histamine is the surest way of producing a secretion of gastric juice.

Now let us examine the sites where ulcers occur and see if they are such as to be strongly affected by any possible sensitivity. In my opinion they are.

Food entering the stomach is shown radiologically (O'Sullivan⁽³¹⁾) to be held for a definite though short period in the cardiac end of the stomach just above the incisura.

After a short period, the stomach relaxes and the food passes into the pyloric end, where it is forcibly brought into contact with the mucosa by the grinding action of the antral muscle. Having undergone this process for a while, it is forcibly squirted through the pylorus hard against the duodenal walls, and here it again remains for a moment dilating the first part of the duodenum before it is passed on into the second part, whence it passes on quickly to the jejunum. (How forcibly food is squirted against the duodenum was brought home to me on one occasion when I operated for a perforated duodenal ulcer, and found a wooden tooth pick that had been pushed through the anterior duodenal wall.)

Now let us take a few facts that are common knowledge and see how they fit in with the foregoing. First, the further food progresses through the stomach, the more fluid it becomes and so the more accessible are its chemical molecules. Secondly, ulcer is more frequent the further we pass along the stomach and duodenum. Thirdly, duodenal ulcer is the most common ulcer in both sexes, though there is a higher relative frequency of gastric ulcer in females. Fourthly, each of the acknowledged sites for an ulcer is immediately proximal to a sphincter, this being a location where a little delay occurs, giving time for chemical action. Fifthly, ulcers frequently diminish after the performance of gastro-jejunostomy, which hastens the emptying time and consequently allows less opportunity for chemical action.

If my reasoning is correct, the site of greatest frequency for ulcers should be determined by those factors that give the chemical action between the mucosa and allergen the best opportunity to occur (thus producing the more severe degrees of gastritis), and by those factors likely to increase the action of any rough particles on damaged, weakened mucosa.

Now let us consider how these factors apply in the various ulcer sites. Allison⁽⁴⁶⁾ has found that cure of peptic oesophageal ulcer can be obtained by preventing the excessive action of gastric juice on this area. The next least frequent ulcer is that one found high on the lesser curvature. Here the food, which has hardly started its digestive process and is not dissolved, is in contact with the mucosa for only a short period. That is, where the factors are at their feeblest, ulcer is of least frequent occurrence. The site of next frequency is in the antrum. Here the process of digestion has progressed, therefore the food is more fluid, and muscle action grinds the food firmly against the mucosa. At the most frequent site, the first part of the duodenum, the food is more digested and of still more fluid consistency, and is squirted forcibly against the duodenal wall and then further squeezed by the contracting action of the muscle walls. According to the above factors, an ulcer should be most frequent here, and so it is.

The beneficial effects of gastro-enterostomy on some patients is produced by the quickened emptying time of the stomach and by the partial or complete diversion of the flow away from the duodenum. This shortens the time for chemical action, and takes some but not all of the food away from the duodenum. Therefore some patients do well and others not so well. Dr. John O'Sullivan informs me that his impression as a radiologist is that food remains longer in a woman's stomach than it does in a man's. This increased opportunity for the chemical action to occur may be responsible for the higher incidence of gastric ulcer in women. The higher ratio altogether in men can be accounted for by the fact that they are mostly engaged in those occupations which give rise to mental anxiety, physical strain and overwork—conditions that are frequently associated with dyspepsia (the business man's stomach). Vaughan⁽⁴⁷⁾ states that the chemical allergic response can be shown to be associated with failure of satisfactory adjustment to environmental problems. Dragstedt⁽⁴⁸⁾ states that ulcer is due to excessive quantities of gastric juice, and then, because this can be present in various states, he declares without further proof that this hypersecretion is neurogenic and abnormal. I do not know what is the difference between normal and sensitive tissue. It may truly be nervous. Whatever may be the cause, the practical assumption is that there is a difference

between the two. I should think that such a sensitivity resulting in the infliction of frequent chemical trauma would be a most likely cause of the gastritis, which in turn is responsible for the oversecretion of the digestive juices that are ready to take advantage of any sort of diminished resistance and so lead on to ulcer.

Summary.

Let us now summarize this far:

1. It is stated that allergy is the result of chemical action.
2. Therefore the effects of sensitivity should be most pronounced where the action has the best opportunity for occurring.
3. That this is the case is suggested by the relative frequency of ulcer in the various ulcer sites.

Gastro-Jejunal Ulceration.

The formation of a new ulcer on the stoma is the most dreaded complication of gastric surgery. The ulcer, which in all ways behaves as any other peptic ulcer, is situated most usually on the stoma and less usually on the jejunal wall. It may occur within a few weeks of the operation or may not be apparent for years. The ulcer is said to occur most frequently after gastro-jejunostomy. If it occurs after a gastrectomy, it usually follows the type of operation in which a rather small part of the stomach has been removed, and is sometimes cured by removing a further quantity of stomach. Operations of the exclusion type, which leave a greater or lesser quantity of the antrum, have been singularly unsuccessful in this respect, and I think have by now been largely abandoned, or improved by the removal of the complete mucosa of the antrum. Another interesting fact is that when, owing to the presence of gastro-jejunal ulceration, the anastomosis has been undone and the stomach reformed, the reconstruction is usually followed by a recurrence of the original peptic ulceration.

The new ulcer is a grievous disappointment to the patient, who has undergone a major operation seeking relief from his symptoms, and an anxiety to the surgeon, because the new ulcer has all the possibilities of the old, with the additional risk of involving the colon and colonic vessels.

Gastro-jejunal ulceration occurred frequently in times past when the operation of gastro-enterostomy was regarded as somewhat of a panacea for all forms of dyspepsia and a certain cure for a duodenal ulcer. It soon became noted that the shorter the history and the higher the acidity, the more likely was this complication to follow.

It is interesting to see how far the hypothesis advanced for the causation of gastric and duodenal ulcer can be held to account for the stomal ulcer. The new ulcer should be explicable on the same basis as the original ulcer, or the theories advanced cannot be wholly true. An old theory maintained that the lower in the jejunum the new stoma was located, the more likely was stomal ulceration to occur, because the further it was from the duodenum, the less likely the bowel was to be able to resist the acid juice. This theory sounds reasonable, but there are facts which seem to prove it wrong.

1. Recurrent ulceration has taken place in the presence of a gastro-duodenal anastomosis.

2. Gastro-jejunal ulceration was more frequent in the old days, when a posterior no-loop gastro-jejunostomy was performed, the jejunum being used as close as possible to the duodeno-jejunal junction, than today when an anterior gastro-jejunostomy is a frequent termination of a gastrectomy operation.

3. Dragstedt,⁽⁴⁹⁾ transplanting various portions of the jejunum, ileum and colon into the stomach wall, found that, provided the blood supply of the transplant was correct, no ulceration would occur.

4. I have never seen or heard of a gastro-jejunal ulcer occurring in the stoma after a gastrectomy for carcinoma. It may be answered that not a sufficient number of patients live long enough to develop the ulcer, and this may be true. However, I should think that if the condition occurred, it would be better known. Holman⁽⁵⁰⁾ states that in resections for cancer, since there is no danger of jejunal ulceration

(incident to deflection of the alkaline secretions away from the anastomosis), an entero-anastomosis is a safe procedure.

In the discussion on peptic ulcer, it appeared that ulceration occurred where the mucosa was fixed to the underlying muscle and at those spots where delay occurred. It is my opinion that this state of affairs, which is frequent at a gastro-enterostomy stoma, can be avoided to some extent if certain details of operative technique are recognized. A gastro-enterostomy should be so made that the mucosal union is capable of sliding easily over the muscle joint. The customary all-layer suture produces a scar that must help in some degree to fix mucosa to the muscle, and in my opinion should not be used, the mucosa and peritoneum being sutured separately. Another technical detail which I think can lead to trouble is that, from anxiety to suture the two viscera securely, the surgeon takes up too much jejunum in the sewing, producing a diminution in size of the jejunal efferent opening. In making an anastomosis it must be remembered that the exit for the gastric contents depends, not on the length of the gastro-jejunal anastomosis, but on the size of the jejunal efferent lumen, and if this has been made small by over-careful suturing, the stomach contents may be held longer in the stomach, the chemical interaction mentioned before thus being allowed to occur. Moreover, it does not require a great stretch of imagination to see that the jejunal wall may be sensitive to some proteins, and if this should be so, the longer the period of contact, the greater the likelihood of inflammation with subsequent damage and consequent ulceration.

Gastritis and Carcinoma.

The vexed question of the relationship existing between carcinoma and peptic ulcer may possibly receive a little illumination from this viewpoint. Of course, until the nature of carcinoma becomes known, nothing can be sure and definite; but at least we can speculate with a fair chance of being right that the type of thing that occurs in one organ will, if the circumstances are similar, occur in another. Then why, if chronic inflammation in the breast, tongue, lip and *cervix uteri* is followed by carcinoma, should not chronic gastritis be also a precursor of carcinoma of the stomach? Again, it is difficult at times to distinguish microscopically between carcinoma and chronic inflammation and to say where chronic inflammation ends and carcinoma begins. This being so, is it not probable that the gastric carcinoma occurring after years of ulceration is due to the underlying gastritis? In other words, the gastritis may be a precancerous condition in the same sense as a chronic ulcer is widely believed to be precancerous. This is important when one is considering the treatment of a chronic gastric ulcer in relation to cancerous change.

Eusterman⁽³⁶⁾ reiterates a frequently made observation—namely, that a session of medical treatment for ulcer will frequently improve the condition and relieve the symptoms of a patient with carcinoma. This is said to be due to the effect of treatment on the secondary ulceration and occurs when the base fills up; but I think a more reasonable explanation is that the improvement is due to the effect of treatment on the underlying gastritis.

Treatment.

Our treatment can be only empirical until we know something about the control of the nervous element, whose irritation or strain seems to upset the allergic or the dyspeptic. Some people can eat anything when on holiday, but must eat with discretion when at home and working in order to avoid indigestion; others are more or less constantly ill. Some are well in the warm weather and have dyspepsia when the weather is cold. A few words with the wife or from the bank manager may also start an attack. Some people can stand all such disturbances and other sources of irritation, eat heartily of the heaviest foods and suffer no ill-effects.

Until we can do something about this nervous element, our treatment has no sure foundation. We can only, on general lines and in the early case, advise rest—mental,

physical, chemical and digestive. This is the time when a search for food sensitivity will sometimes be successful, and so it should be undertaken as early as possible.

In the individual case the question of treatment will depend on the stage arrived at in the life history of the gastritis, and the following stages may be recognized: (i) gastritis without ulcer; (ii) gastritis with uncomplicated ulcer; (iii) gastritis with ulcer which has lasted for many years; (iv) gastritis with complicated ulcer; the ulcer has (a) perforated into the peritoneal cavity, (b) penetrated into an adjacent organ, (c) caused haemorrhage, (d) produced a cicatricial deformity; (v) suspected onset of carcinoma.

Until complication has occurred, the treatment of peptic ulcer is that of the underlying gastritis, and these two conditions will be discussed together. The classical treatment is rest, which should be applied to give not only digestive rest, but also chemical rest to the stomach and mental and physical rest to the patient. When it is possible to give the patient the full rigor of this treatment, he should be admitted to hospital and kept in bed, and if any mentally disturbing factors are known, they should be carefully excluded. The patient is put on a very mild diet, which conventionally is one of milk and perhaps eggs. He is fed at frequent intervals in an endeavour to keep the gastric juice neutralized, and this endeavour is supplemented by the administration of various chemical compounds calculated to neutralize, absorb or adsorb the acid.

After an arbitrary period of time, which varies to some extent with the personal vagaries of the attending physician and the patience of the patient, this diet is supplemented and gradually built up to what is called a "gastric III" diet—the dyspeptics' optimum—and on this he is discharged from hospital and expected to keep symptom free, which he sometimes does and sometimes does not. Why is this so? Why does one patient respond kindly and not another? Why does a patient who has improved rapidly while in hospital break down immediately he returns to work? Thinking along the lines suggested earlier provides a fairly reasonable explanation. If the patient has not a sensitivity to one of the "simple foods" of the "gastric" diet—namely, milk, eggs, flour (which, by the way, are stated by Kennedy⁽³⁷⁾ to be the most frequent allergic antigens)—he will get better quickly and will stay well so long as he does not depart from his diet; but should he have such a sensitivity, then one of two things will happen. If his sensitivity is pronounced, he will continue to have pain whilst he is in hospital and eventually leave in disgust or will be operated on. If his sensitivity is only slight, then the physical rest and freedom from worry associated with his hospital stay will allow him to absorb his antigens without any great discomfort; but his return to the workaday world with its worries will bring on a breakdown, even though—and possibly because—he adheres rigidly to his diet.

For the above purposes many different types of diet and many different drugs are used; but they are all variations on the same theme and are basically the same. A suggestive observation is that to some extent the results of treatment vary with the social and financial status of the patient; the wealthy get well and usually stay well, but the poor cannot have the mental and physical rest required to keep well, and so break down.

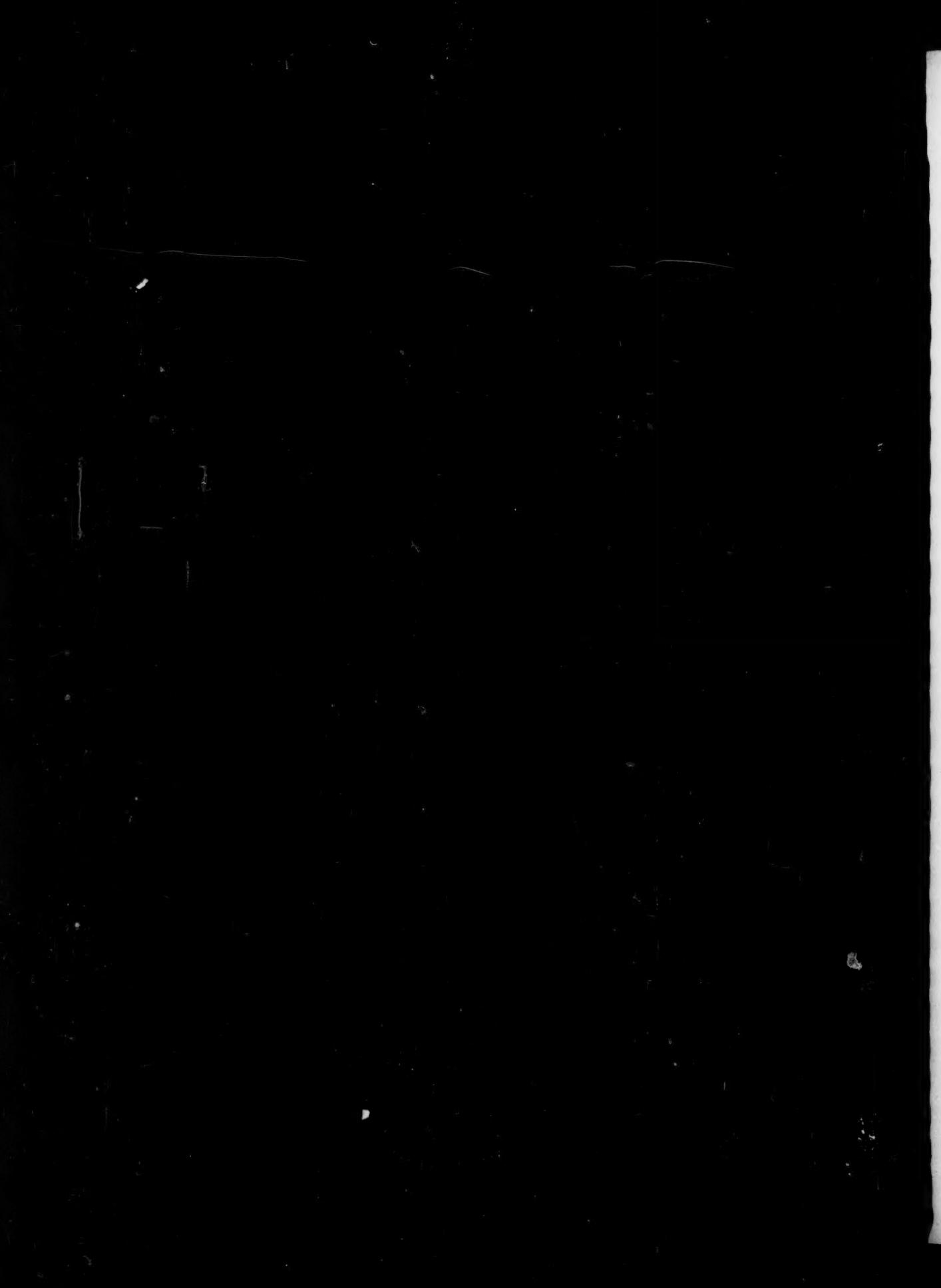
In this connexion it is amusing to think of the aged, multi-millionaire dyspeptic, who with his millions continues to drag out an uninteresting existence, denying himself the pleasure of the table at a time when the other physical pleasures are beyond him, and living on milk and biscuits, when in all probability he could be living royally on the world's best foods, avoiding only the one or two which his stomach cannot manage. He is, of course, the exception, as it is the poor, hard-working man who is usually the dyspeptic. However, even in the best hands, the periodical treatment of peptic ulcer is lengthy and probably success is a fluke. The following clinical history illustrated the extent to which treatment and observation can be carried. It was quoted by Palmer⁽³⁸⁾ whilst he was making an observation on another subject. The patient,

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who was achlorhydric, came under notice on April 2, 1936, when the X-ray diagnosis of a small gastric ulcer had been made. The record ceases on October 31, 1944—a period of just over eight years, during which time the patient had 29 X-ray examinations and 59 gastroscopic examinations. The last report was "shallow ulcer 3 mm. in diameter". Now this patient was constantly under observation by skilled people, having the most modern treatment at their disposal, and she still had an ulcer after eight years of such treatment. In my opinion, the obvious comment is that the methods used must be basically incorrect.

The diet variations are many, the chemical additions legion. I do not propose to discuss here the various diets, but would merely point out that they are mostly built on a foundation of milk, and that milk is often an allergen. If the patient does not do well on milk, it may be because he is milk-sensitive. Before presenting any diet it is well to find out the type of food being eaten by the patient. If he is taking the business man's diet of soup, steak and Worcestershire sauce, alcohol, tobacco and apple pie, then a milk diet will probably cure him; but if he has already tried a milk diet and is still suffering, then more milk, even if given with a different alkaline powder, will not do any good. As a rule, when a patient has had dyspepsia for years he has many ideas about his diet, some founded on personal observations which may be useful, and some on the advice of friends, these being useless. It is difficult sometimes for him to sort out the foundation for his prejudices.

Sometimes the giving of milk and alkali by means of a continuous drip through an indwelling tube passed through the nose into the oesophagus will prove useful, as it provides immediate neutralization for the constantly secreted hydrochloric acid. The passage of a fine stomach tube and the evacuation of acid fluid from the stomach will in many cases give relief if it is carried out frequently.

Before leaving this subject one must emphasize now the importance of early effective treatment. If relief is obtained early and completely, the patient will probably stay well indefinitely; but if his relief is only partial, it is fair to assume that some cause is still acting. If relief is not obtained early, it is probable that atrophic changes will eventually take place in the mucosa and that ulcer will occur.

Gastritis and Uncomplicated Ulcer.

If the dyspepsia is mild and the dietary is seriously wrong, and if the barium meal examination reveals no ulcer niche, it is frequently possible to clear up most of the trouble with some simple instructions and an alkaline powder. If the indigestion is severe and no ulcer is disclosed by X rays, it will be wise to admit the patient to hospital and give him the full rigor of medical treatment. Should there be signs of penetration, all suggested means should be used, because unless relief is quickly provided, pain may force the patient into having surgical treatment.

Complicated Ulcer.

If the ulcer has penetrated, and if the history is short and the pain not too severe, medical treatment may be tried and may be successful. If it is not successful, surgical treatment may be the only hope of providing relief. If the pain is mild and the disease has not lasted long, a determined effort should be made and every method used to obtain relief; but if no relief can be provided for severe pain, then surgical treatment should be contemplated and its risks explained to the patient. When an ulcer penetrates an adjacent organ, it usually means that the ulcer is of long standing, and that the associated gastritis has lasted even longer.

Many of these penetrating ulcers will therefore come under the same heading as the ulcer which has lasted for some years. When there is a history of years, the gastric mucosa, particularly the antral part, will almost certainly show the atrophic changes characteristic of the last stages of any long-continued inflammatory process. When this has occurred, not only is the dyspepsia incurable by medical means, but there is always the risk that carcinoma may develop on the gastric mucosa. Attempts have been made

to prove this statistically, but without success. If the patient is prepared to take the risk of ensuing carcinoma, and can afford the time, patience and expense of the oft-repeated X-ray examinations, then he may prefer to continue on medical treatment; but if he does not choose this type of life, surgical treatment is the only way out for him.

The ulcer may have produced a cicatricial deformity. This is a diagnosis that may be wrong, because the spasm of the circular muscle or the local swelling around the ulcer, or both, can produce mechanical defects in the stomach disturbing its function in a manner closely resembling symptoms produced by cicatricial deformity. Response to medical treatment, as evidenced by freedom from pain and alteration for the better of the stomach functions, is the indication for further medical treatment. However, should medical treatment fail, it must be assumed that the interference with stomach shape and function is due to cicatricial contraction and will respond only to surgical treatment.

When surgical treatment for any of these three conditions is indicated, one must consider the underlying gastritis as being the lesion requiring treatment, and the atrophic mucosa bearing the ulcer should be removed if possible. If the patient is ill or old and has pyloric stenosis, a gastro-jejunostomy may be beneficial, at least temporarily. If possible, it should not be regarded as final. Excision of the ulcer with or without gastro-enterostomy is of no avail. Cautery puncture of the ulcer with gastro-enterostomy will give results about equal to those obtained by simple gastro-enterostomy. Pyloroplasty and gastro-duodenostomy, whilst improving the emptying of the stomach, fail to improve the weakened, atrophic mucosa.

Surgical Treatment.

The ulcer-bearing part of the stomach is the alkali-secreting pyloric end of the stomach. This part extends up along the lesser curvature, and should be removed as well as the first part of the duodenum. The amount of stomach to be removed is the same whether the operation is for gastric or duodenal ulcer; the important point is that none of the pyloric mucosa be left. In some of the exclusion types of gastrectomy, portions of the pylorus used to be left and the operation was frequently followed by a gastro-jejunal ulcer. A recent modification, occasionally useful in a difficult case, is to cut the antrum across, to shell the mucosa from out of the muscle coat and to invert the muscle and serosa with several layers of sutures.

I have had good results from a gastrectomy which divides distally the first part of the duodenum and extends to above the angularis proximally, taking not less than 60% of the stomach. The repair is made by closing the duodenum and intussuscepting it into the pancreas and then performing an antecolic isoperistaltic gastro-jejunostomy, leaving a good loop between the duodeno-jejunal junction and the stomach. When a penetrating ulcer is present, the stomach or duodenum can be peeled away from the edges. The floor, cauterized or not, is left *in situ*. It will do no harm.

Perforation.

Perforation is an emergency, and in my present opinion should be treated as such, and not used as the indication for radical treatment of the underlying condition. I believe in simple closure with interrupted sutures and the addition of an omental patch, with or without such drainage as may be indicated at the time. This often produces a cure, but if not, a course of medical treatment later on will help. If this is not successful, more surgical treatment can be carried out at a later date. Should there be a long history, and should closure be difficult, a gastrectomy may be the reasonable method of treatment.

Hæmatemesis.

Hæmatemesis is an emergency that requires the best efforts of any practitioner, and to handle it successfully requires a nicety of judgement and a degree of skill that are possessed by few. The "always and never" fallacy was never more aptly demonstrated than in dealing with

haematemesis. To operate always or to operate never is just as wrong as to treat every patient medically or to treat no patients medically. I have just explained that I consider ulcer to be merely an incident in the life history of gastritis. This conception is important when one considers that haemorrhage frequently occurs without a radiologically visible ulcer, notwithstanding a long history of dyspepsia. One wonders whence comes the haemorrhage.

The haemorrhage in some cases is said to come from extragastric conditions which cause venous congestion in the portal system—for example, cirrhosis of the liver. In this condition the haemorrhage has been stated to come from varicosities where the systemic and portal circulations meet, the argument being probably founded on analogy with the bleeding of haemorrhoids. Haemorrhage is most commonly thought to come from a vessel in the floor of the ulcer, but it is hardly ever thought to come from the mucous membrane of the stomach, though why it should not I cannot see. A kidney bleeding from nephritis, a vesical papilloma bleeding furiously without any gross ulceration, and haemorrhoids bleeding freely are all examples of gross haemorrhage from surfaces that present no large break. If these membranes can bleed freely, why cannot the mucosa of the stomach do likewise when inflamed? It is my opinion that in a great many cases of haematemesis in which no ulcer can be demonstrated and in which none of the extragastric causes are operative, the haemorrhage probably comes from the mucosa of the stomach. For my part I have seen patients with haematemesis who had a long history of dyspepsia before the haemorrhage occurred, and who were not found to have an ulcer on X-ray examination, recover immediately from their hemorrhage, then suffer from dyspepsia again. I have operated on patients who had an ulcer proved to be present radiologically or at operation, who had had several severe haemorrhages and who were operated on for fear of another severe haemorrhage; examination of the stomach after removal revealed no ulcer, and they have had no hemorrhages since the gastrectomy. For these reasons I have come to the conclusion that the gastric mucosa can bleed and bleed freely. I should think that a number of patients who have intermittent hemorrhages and recoveries provide examples of this occurrence.

Another cause of haematemesis is, of course, the eroded vessel lying in the floor of the ulcer. Such vessels cause severe loss of blood and often accurate diagnosis is made at the autopsy. The haemorrhages are severe because the inflammatory sclerosing process associated with an ulcer will nearly always obliterate a vessel of small size before it comes close enough to the ulcer surface for the digestive process to cause a hole by erosion. Any vessel large enough to escape the process is of such size as to be capable of severe haemorrhage, especially as these vessels are not far from the aorta.

When one is assessing the relative values of medical and surgical treatment, it is important that operation be regarded as an immediate means of treatment as soon as it is indicated, and that it be not deferred till it becomes a last desperate effort to save life, when its success is jeopardized and it may be unjustly condemned if it fails. The patient not subjected to operation who dies whilst having medical treatment is just as dead as the one who dies whilst in the surgeon's care. If operation is to be used, it should be decided on at a time when it is possible to resuscitate the patient reasonably well, and by transfusion to put him on the operating table in a condition that will allow a reasonable expectation of recovery after a moderately severe operation.

I should like to suggest that haemorrhage is a surgical emergency, and that these patients be admitted to hospital first for surgical care, and handed over to the medical staff when it is obvious that no operative assistance is likely to be needed. The care of these patients by means of blood transfusions, fluid replacements, stomach suction and irrigation is so much along general lines that surely nothing will be lost by having them under a surgeon's care. Again, medical treatment is fairly simple and can possibly be handled quite as well

by the surgical staff who, having the patient under direct observation, will have adequate warning of the possibility that operation may be necessary. As operation is a procedure taking two hours or probably more, it is necessary to have this warning so that the surgeon may adjust his affairs accordingly.

Medical treatment has been adequately considered in many books and papers, and so I do not propose to discuss the details here. It is mainly dietary and medicinal; the administration of Congo red intravenously and oxalic acid intramuscularly is said to be of use in increasing the coagulability of the blood.

Surgical treatment may be divided into two sections: replacement therapy and treatment directed towards obtaining haemostasis. In achieving haemostasis a gastrectomy with the removal of haemorrhaging ulcer is what one would always like to perform, and when this is possible it should be done; but unfortunately there are cases (the majority) in which either no ulcer can be seen or it is found to be on the posterior wall of the duodenum. If no ulcer is found, it is most probable that the haemorrhage comes from gastritis, and the part of the stomach where this is most pronounced is the antrum. Patients suffering from haematemesis and subjected to laparotomy are probably in danger of death from haemorrhage, and if no more is done, death from haemorrhage may occur. I saw one patient recently whose abdomen was opened and closed because no bleeding site was seen, and whose haemorrhage promptly ceased. I think this was fortunate, and that the patient would have had a better chance of living if subjected to gastrectomy. If the haemorrhage is coming from an ulcer on the posterior duodenal wall, a gastroduodenectomy should be performed, the ulcer being left *in situ*. It can now be fulgurated, or the haemorrhage can be stopped by suture. When a repair operation is undertaken, the ulcer site should be excluded from the duodenal lumen so that the digestive process will not cause further haemorrhage.

Owing to the free anastomosis, attempts to stop by ligature the haemorrhage from a posterior wall ulcer are doomed to failure from the start (Shapiro and Robillard⁽²⁰⁾).

The associated features of a case are variable; but some of them have an influence on the decision whether to operate or to use medical treatment. It is in the early stages of this disease that one must use all the judgement one possesses. The old statement that surgery is reserved for people with known ulcers is a generalization with many fallacies. The patient may have an "unknown ulcer" which becomes known at autopsy; he may bleed to death from gastritis when a partial gastrectomy would have saved him. Actually an attempt must be made on clinical grounds to guess how ill the patient is going to be and how well he will stand anaemia and operative shock. One should also try to guess what the lesion may be that is causing the haemorrhage. If after a consideration of these factors it is thought that the haemorrhage is going to be severe and that the patient may require operation, then I think operation should be performed as soon as reasonably possible. If the patient has had previous hemorrhages, never severe, then I think he may be tided over his haemorrhage, and at a later time consideration may be given to the possibility of his requiring operation at some future date.

Summary.

1. An attempt has been made to prove that peptic ulcer is the result of digestion of an area of diminished resistance. Gastritis is always present; this is responsible for the continuous secretion of gastric juice, which in turn acts on the area of diminished resistance.

2. It is suggested that the gastritis is due to an allergic sensitivity to common foods.

3. The ulcer so produced has no importance in the causation of symptoms until one of the usual complications arises.

4. It is suggested that a haematemesis may come from gastritis when no ulcer is present.

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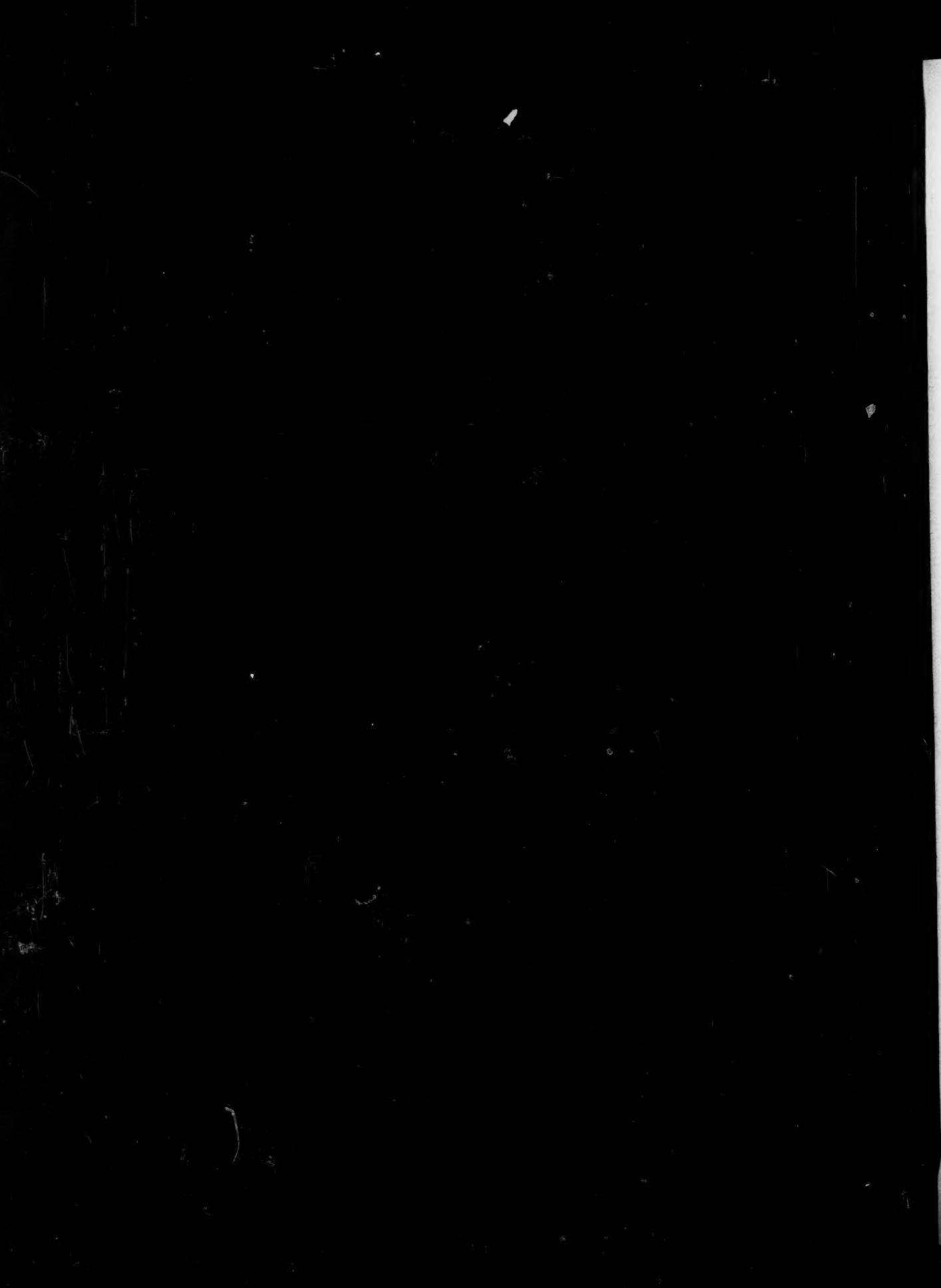
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5. It is important that this food sensitivity be recognized as early as possible, so that the condition may not progress until atrophic gastritis has developed. When a condition of atrophic gastritis has arrived or when an ulcer has penetrated into an adjacent organ, it is probable that medical treatment will only alleviate the condition temporarily, and that if a cure is desired, surgical treatment offers the most hope.

6. Haematemesis, like other forms of haemorrhage, is a surgical lesion, and patients so affected should be under the surgeon's care until it is obvious that medical treatment only is required.

Conclusion.

In conclusion, I would wish that the hypothesis advanced be thought over. I believe that if this is done, the hypothesis will be found to explain much that is obscure about the behaviour of this painful and wearying disease.

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THE CLINICAL IMPORTANCE OF STOMACH MUSCLE.¹

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INDIGESTION is an important medical problem. It is probably the commonest ailment the physician has to treat, either in the consulting room or in the hospital clinic. Many cases of dyspepsia are aggravated by the rush and hurry of modern life, with its fatigue, worries, irregular meals and nervous tension. These conditions probably react most harmfully on the sensitive and energetic persons, who are kept by such conditions below their normal physical and physiological standard.

Indigestion is not a definite clinical entity. It is merely a name for a variety of symptoms and has many different causes. Each case requires careful investigation and examination.

Dyspeptic symptoms of various kinds are common to gastric and duodenal ulcers, appendicitis, cholecystitis and gall-stones, to liver and intestinal conditions, to malignant growths affecting the digestive system, and to early congestive heart failure, as well as to many visceral disturbances, such as pulmonary tuberculosis. When each of these has been eliminated as a cause, there still remains a fair number of cases usually summed up in the term functional or nervous dyspepsia.

It is certain that indigestion can arise from emotional disturbance, mental strain, shock, worry or fear. From the time of Pavlov's experiments it has been known that "food eaten with pleasure leaves the stomach faster than when put in with a stomach tube". It is doubtful, however, whether all the symptoms sometimes supposed to be due to psychological conditions, such as phobias, anxieties or frustrations and inhibitions, are really of psychological origin.

The diagnosis of nervous dyspepsia from that of organic origin is always difficult and must be tentative, because the symptoms may be due to some physiological abnormality, or to some pathological condition not yet detected.

In normal good health all digestive functions—peristalsis, secretion and absorption—are carried on automatically by the autonomic nervous system and are not under the conscious control of the higher centres. The symptoms usually complained of by persons with functional or nervous dyspepsia are as follows: discomfort after meals, anorexia, flatulence, headache, constipation, sometimes bilious attacks and frequently physical weakness out of all proportion to its apparent cause. There may or may not be a history of migraine.

Physical examination reveals very little abnormality. The patient is usually undernourished and some degree of anaemia is present. Both test meals and X-ray examina-

¹ Read at a meeting of the Victorian Medical Women's Society on April 14, 1946.

tions give negative results. Occasionally the X-ray report states that there is evidence of residual air or gas in the stomach. It is usually the asthenic, never the muscularly fit or athletic type of person, who suffers from nervous dyspepsia. Treatment by tonics and holidays causes improvement for a time, but frequently this improvement is temporary and sooner or later the same symptoms reappear.

The possibility of some muscular disability of the stomach is rarely considered, although it is probable that the muscular function of the stomach is as important as its secretory function. Of recent years there has been a change from the importance formerly laid on secretory disorders, to alterations in the motility of the stomach. Although this is so, medical textbooks still mention only two conditions due to muscular derangement. These are atony and dilatation of the stomach, and great confusion still seems to exist with regard to their significance. The aetiology usually given is that both are a form of dilatation caused by functional loss of tone. Each seems to be regarded as of purely nervous origin, due to long-standing neurosis and nervous depression.

McCrae and Funk⁽¹⁾ call attention to the importance of the motor function of the stomach in both health and disease. In this textbook it is stated that a German physician named Boaz was the first to describe *myasthenia gastrica* as due to muscular insufficiency; the authors consider that "it is important that cognisance be taken of motility in the evaluation of gastric and functional analyses".

In gastric atony the stomach walls may have become weakened to such an extent that the stomach is no longer able to pass its contents into the intestine at the normal rate. The loss of tone may be due to repeated over-distension and may be accompanied by depression of the autonomic nervous system, resulting in both pathological and psychological symptoms. These nervous symptoms may be the result, not the cause, of the pathological changes. Unfortunately, by the time either gastric atony or dilatation of the stomach is clinically recognized, the change in stomach muscle is no longer physiological, but has become pathological. Before such a serious condition of the muscular walls of the stomach as atony or dilatation occurs, it is probably preceded by varying degrees of weakness and enfeeblement of the stomach muscle. It seems probable that there may be four degrees of this muscular weakness: (i) *hypotonia gastrica*; (ii) *myasthenia gastrica*, a more chronic degree of hypotonia; (iii) atony of the stomach, a still more advanced muscular change; (iv) chronic dilatation of the stomach, in which there is a more or less complete breakdown in stomach muscle with pathological changes.

Acute dilatation of the stomach is a rare and usually fatal condition and will not be considered here.

Hypotonia gastrica and *myasthenia gastrica* may occur in both children and adults, and may follow malnutrition, improper feeding, serious or debilitating illness, or long-continued strain and overwork causing physiological fatigue. It is essential that the early stages of *hypotonia gastrica* and *myasthenia gastrica* should be recognized, for it is then that cure can be complete; otherwise, these conditions may drift on, perhaps for years, until a stage of gastric atony is reached, when cure will be a long and tedious affair, and will depend on the amount of damage already done to the stomach muscle. If the state is allowed to drift still further, chronic dilatation may follow, when cure is hardly likely to be achieved, and only symptomatic treatment will be possible.

Further knowledge of stomach muscle and stomach movements is still necessary, in spite of the enormous amount of research that has already been done. What knowledge we have of stomach movements has been largely derived from radiology following the giving of an opaque meal. Cannon, at the end of the last century, was the first to use this method. He made exact observations on the movements which the stomach performs, from the time it is filled with food until it empties itself.⁽²⁾

Later, with the development of serial radiography, an immense amount of work on gastric peristalsis was done

by Cannon, Cole, Barclay, Alvarez and many others. Alvarez states that "a great deal of information of stomach movements has in this way been obtained, but, even so, great gaps in our knowledge of gastric peristalsis still remain".⁽³⁾ Cole has stated that the first part of the duodenum virtually belongs to the stomach and that this should be considered when gastric movements are under investigation.⁽⁴⁾ Alvarez seems to corroborate this when he states that the duodenal cap is peculiar anatomically and that in some ways it resembles the stomach more closely than the bowel.⁽⁵⁾ Later, Alvarez introduced the "electrogastrograph" to take accurate graphic records of gastric peristalsis, but found their interpretation very difficult.⁽⁶⁾ With the introduction of the "Röntgen cinematograph", motion picture records of stomach movements were made. Alvarez's report on these records was that they showed "all sorts of combinations of waves, systoles, tonus waves, ripples and reverse waves".⁽⁷⁾

Forsell, the Swedish investigator, stressed the importance of the *muscularis mucosae* in peristalsis.⁽⁸⁾ Cole corroborated this, but went a step further by stating that gastric peristalsis was a function of the *muscularis mucosae* and did not involve the outer walls of the stomach.⁽⁹⁾

To try to solve this question, in 1939 Gordon and Singleton performed an unusual experiment when they sewed opaque steel beads on the outer wall of the stomach of an anaesthetized animal. They followed this by fluoroscopy after giving a barium meal. They think that Cole may be right with regard to one type of peristalsis, but suggest that there may be two types of peristalsis, one involving the entire musculature and the other the *muscularis mucosae*.⁽¹⁰⁾

Alvarez's final summing up⁽¹¹⁾ is as follows:

There is a great deal of disagreement between various workers, because it is hard to imagine a phenomenon more cunningly designed to confuse the observer. It is possible that more than one mechanism is concerned in the causation and maintenance of gastric peristalsis.

Here the problem rests at present.

Some anatomical facts about the digestive tract are worth remembering. My authority is the latest edition of "Quain's Anatomy".⁽¹²⁾ It is here stated that the muscular coat of the oesophagus consists of an outer longitudinal layer and an inner circular layer of muscle fibres, with an internal layer of mucous membrane. Attention is called to the fact that these two layers of muscular tissue continue through the whole length of the alimentary canal, from the pharynx to the anus. The muscular wall of the stomach itself is described as consisting of the following five layers, together with nerves and blood vessels: (i) the outer serous coat derived from the peritoneum; (ii) a layer of longitudinal fibres directly continuous at the cardiac end of the stomach with the longitudinal layer of the oesophagus, and at the pyloric end becoming continuous with the longitudinal layer of the duodenum; (iii) the circular fibres which form a close and compact layer over the whole stomach; this, like the previous layer, is also continuous with the circular fibres of the oesophagus and duodenum; (iv) the oblique fibres, which are continuous with the circular fibres of the oesophagus, and from the cardiac end descend obliquely over the anterior and posterior surfaces of the stomach, to end apparently by mingling with the circular fibres at the pylorus; (v) most internal of all is the layer of the *muscularis mucosae*.

Stomach muscle and that of the whole digestive tract consists entirely of smooth unstriated muscle fibres. Although smooth muscle is of so much importance to so many vital physiological functions, its study appears to have been difficult, because of its anatomical distribution. Knowledge of its action and function is still scanty and indefinite. For its distribution my authority is again "Quain's Anatomy".

Smooth muscle is found in the trachea and bronchial tubes, in the oesophagus, stomach and duodenum, and in the whole intestinal canal, not only in the muscular coat, but in the *muscularis mucosae* and in the villi as well. It is also found in the bladder, uterus, and sex organs of both sexes, in all glands and gland ducts, in the heart and

middle coat of the arteries. It is present in the coats of the larger lymphatics, in the skin all over the body, between the sweat ducts and the epithelium, and in the minute muscles attached to the hair follicles, as well as in the orbit, the scalp and parts of the skull.

Embryologically, smooth muscle is said to differ from voluntary muscle in that smooth muscle develops from the mesenchyme, while voluntary muscle develops from the mesoderm.⁽¹³⁾ Smooth muscle also differs from voluntary muscle in so far that it does not seem to be dependent for its normal stimulus on its connexion with the central nervous system and in the fact that a contraction started at any point in smooth muscle is slowly propagated far beyond the limits of its point of origin.

Stomach muscle is autonomous, and seems to be able to contract in a normal manner even when all connexions between the stomach and nervous system are cut, as in decerebrate cats.

Alvarez has suggested the name musculo-neural for this smooth muscle tissue.⁽¹⁴⁾

An outstanding feature of smooth muscle is its capacity to maintain a persistent contraction known as tonus—that is, the physical elasticity of living smooth muscle under given physiological conditions. The tone of gastric muscle seems to be more important in producing gastric emptying than even peristaltic activity. Tonus is an important quality, when it is remembered that a hollow viscus, such as the stomach, must alter its capacity to fit the varying volume of its contents. The power of the healthy stomach to adapt itself in this way is remarkable. In the normal healthy stomach some distension seems to act as a stimulant to muscular activity; but extreme distension, as in gaseous distension, is inhibitory. When such distension occurs in an already weakened stomach, the physiological limit of distension is more easily reached, the muscle becomes stretched, and further impairment of tone must follow. The tone of stomach muscle is one of its greatest assets, and a quality which should be preserved and safeguarded as far as possible.

Unfortunately there is as yet no clinical test or experimental method by which the tone of stomach muscle can be estimated. It is because of this living quality of tonicity that the results of experimental tests of distension made on the stomach after death are not the same as if made on the living subject. Experiments in distending the stomachs of dogs and cats after death, or even of the human stomach in the mortuary, are just like blowing up a paper bag; there is no resilience, and as the pressure increases, the stomach bursts.

Textbooks in physiology describe experimental attempts to determine intragastric pressure in the living animal with balloons attached to a manometer and introduced into the stomach by means of a stomach tube. This method shows a higher pressure at the pyloric end of the stomach than at the cardiac end. The balloon method, however, does not determine the physiological limit of pressure, nor the point at which this limit of pressure becomes abnormal.

Distension of the stomach with fluid in a living anaesthetized animal produces no radiologically observable change in gastric peristalsis until the extreme pathological limit is reached and the stomach bursts. The animal being anaesthetized, no sensory or sympathetic changes are discoverable.⁽¹⁵⁾ To experiment in the same way on the human stomach in the living subject, to determine the physiological limit of gaseous distension, is not possible.

Since one could not test the effect of introducing gas, even in variable amounts, into the human stomach, only the converse was feasible and practicable and could be clinically tested—that is, the prevention of gaseous distension in the human stomach, especially the muscularly weakened stomach—and the clinical effects could be watched and determined.

The normal healthy stomach gets rid of gas in three ways: (i) by eructation; (ii) by passing the gas into the duodenum, to be got rid of later by the bowel as flatus; (iii) by absorption into the blood stream. The first two

of these ways are dependent to some extent on healthy tone of the stomach muscle.

Air and gas enter the normal healthy stomach in various ways. (i) Air enters the stomach in the mere act of swallowing. This can frequently be seen during the fluoroscopic screening of a barium meal. It is entirely different from aerophagy, which is due to (a) hysterical air swallowing or (b) air suction, which is involuntary and may be caused by some irregularity in gastric peristalsis. (ii) Gas also enters the stomach when the intrinsic alkali contained in the substance of some foods becomes mixed with the acid gastric juice. It is difficult clinically to prevent gas from these two sources from entering the stomach. The amount is usually small and does not seem more than can be coped with even by the weakened stomach muscle.

It is from extrinsic sources, when gas is deliberately introduced into the stomach from without, that the greatest accumulation of gas is liable to occur. (i) Gas enters the stomach by the swallowing of aerated drinks into which carbon dioxide has been put at high pressure. When this fluid is swallowed, molecules of carbon dioxide are given off until the pressure of the carbon dioxide in the stomach equals that of the carbon dioxide in the fluid. (ii) Gas is also introduced into the stomach by the deliberate addition of alkali to foods. (a) It is the custom to add bicarbonate of soda in varying quantities when cooking green vegetables, to hasten cooking and so save gas and fuel, and for aesthetic reasons, to retain their green colour. (b) All food in which baking powder or self-raising flour is used introduce gas into the stomach.

Until 1853 yeast was the only leavening agent known. In that year a new chemical leavening agent was described in *Les archives de pharmacie*.⁽¹⁶⁾ In 1855 it was introduced into the United States of America as "German Yeast", with the statement that it was "always ready and would keep indefinitely". Later, in New York, a powder was put on the market containing bicarbonate of soda, cream of tartar and starch. This formula has been the basis of most commercial baking powders since that date. Every baking powder on the market contains an excess of alkali. Recent development has been by way of speeding up the time of the evolution of carbon dioxide, and since an excess of alkali is still present, some of the carbon dioxide is evolved in the stomach.

Healthy stomach muscle has a large margin of safety and seems to be able to deal with all the gas supplied to it; but the enfeebled musculature is in a different position. The hypotonic and myasthenic stomach has hardly had time to deal with one load of gas before another is thrust upon it. It seems to be the repeated formation of small quantities of carbon dioxide and its gradual accumulation in the weakened stomach that leads to distension, with stretching of the muscular walls until the physiological limit of distension is reached. The limit of distension probably varies in every person, but the physiological limit will be more quickly reached in the weakened stomach.

Treatment should aim at preventing the accumulation of gas leading to distension, with the danger of causing loss of tone in these susceptible persons. All aerated drinks must be forbidden and no food in which chemical leavening has been used can be allowed. The diet must be strict and rigidly enforced if results are to be obtained.

A well-balanced diet suitable to the age and condition of the patient can be selected from the following items:

Cereal: oatmeal porridge with milk.

Bread: plain yeast bread.

Protein: eggs, minced steak, liver, tripe, beef, mutton, lamb, poultry, rabbit (a diet rich in protein is advisable).

Vegetables: potatoes, marrow, pumpkin, carrots, turnips, parsnips, onions, tomatoes, lettuce, celery and all fresh salads.

Sweets: rice and sago, when procurable; custard, junket, jellies, stewed fruit, baked apples.

Fruit: all fresh fruits.

Fluid: four or five ounces of tea, coffee or milk with meals, and water to be drunk between meals.

Vitamin B₁ should always be added to the diet.

It should be remembered that the mechanical factor in digestion begins with the teeth. Mastication stimulates the rhythm and peristalsis of the whole digestive tract. Therefore, advice should be given to masticate thoroughly and never to eat when fatigued. Constipation should be corrected by mild aperients, never saline aperients. Sleep, if possible, should be longer than usual and without sedatives.⁽¹⁷⁾ Exercise must be regular and moderate, and competitive sport must be forbidden. Adherence to the diet and routine must be rigid and not spasmodic. It may have to be continued not for weeks only, but for months or even longer, to enable the weakened stomach muscle to build up and to regain strength and tone. In time it will be found that most of the symptoms in cases of so-called functional and nervous dyspepsia have disappeared.

With strict and early treatment *hypotonia gastrica* and *myasthenia gastrica* can be cured; thus further deterioration will be prevented, with its subsequent pathological changes in stomach muscle, when cure is unlikely.

It seems that, as in the heart, where a strong myocardium is essential, so in the stomach a strong and healthy stomach muscle is of the utmost importance to the well-being of the patient. It is not only that patients who suffer from functional and nervous dyspepsia are relieved, but as months go past patients who have been subject to migraine will themselves realize that the migraine attacks have ceased.

It is difficult to accept the possibility that migraine, with its complex and far-reaching symptoms, can be caused by distension of the stomach and duodenum carried to the physiological limit. This cause has been suggested many times; but the inexplicable complexity of symptoms has made the nervous theory of the origin of migraine generally more acceptable. Innumerable theses have been written on the subject and many causes suggested; but some obscure nervous origin of migraine has always seemed the most probable. Sufferers from migraine have never shown any constant lesion, nor has any lesion been found when autopsy has been possible, as after death by accident.

It is interesting to note that the most effective remedy yet found for the migraine attack is the intramuscular injection of ergotamine tartrate (0.25 to 0.5 milligramme). In most cases the injection is rapidly followed by vomiting, frequently accompanied by eructations of gas. Complete relief soon follows. The theory generally accepted for the action of ergotamine tartrate in migraine is that it acts through the nervous system, causing contraction of the small arterioles of the brain and dura. The rapidity of action of ergotamine tartrate in migraine seems more like direct action on the smooth muscle fibres of the stomach, similar to the action of ergotoxine on uterine muscle, rather than indirect action through the nervous system. It is probable that ergot and its alkaloids have a selective action on the smooth muscle.

It is necessary to remember again the distribution of smooth muscle. Smooth muscle fibres extend from the stomach and duodenum to the oesophagus, pharynx, sinuses, orbit, scalp and skull, and beneath the skin to the tips of the fingers and the tips of the toes. This distribution would explain the vague paresthesiae which are typical of migraine. This smooth muscle system (musculo-neural apparatus of Alvarez) is far-reaching and may be of much greater clinical significance and importance than is yet known.

Conclusion.

When it is realized that by preventing gaseous distension of the stomach and duodenum to the physiological limit the migraine attack can be prevented, then the need for further investigation will be evident. Such investigation may have to be by way of embryology or by that of comparative anatomy. Further research is indicated and necessary.

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RESULTS OF MANTOUX SURVEY CARRIED OUT AT PERTH CHILDREN'S HOSPITAL.¹

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THERE is nothing new in the making of a Mantoux survey, but so far as I can ascertain no surveys have been performed on any scale in this State and been made public.

The majority of medical men consider the Mantoux test to be of extremely limited value, except possibly when it is applied to very young children. This idea is prevalent because our teachings are based on the results of surveys carried out in large British and European cities where the percentage of positive Mantoux reactors is high compared with Australia and also even parts of America.

For example, in the Prophit survey by Marc Daniels carried out in England from 1935 to 1945,⁽¹⁾ it was found that of 3,764 trainee nurses with an average age of 20.8

TABLE I.¹

Age in Years.	Total.	Total Positive.	Percentage.
3	1	0	—
4	6	1	—
5	57	3	5
6	98	2	2
7	124	6	5
8	92	5	5
9	99	6	6
10	122	12	10
11	150	17	11
12	223	19	9
Total ..	972	71	7

¹ After Fry (Adelaide), 1945.

years only 19.2% failed to react. That is to say, that by the time adult life is reached some 80% of the English population are Mantoux reactors. (By the end of their training this has among nurses become 100%).

¹ Read at a meeting of the Western Australian Branch of the British Medical Association on August 21, 1946.

TABLE II.¹

Age in Years.	Orphans.			Scholars.			Hospital Patients.		
	Total.	Reactors.	Reactors per Centum.	Total.	Reactors.	Reactors per Centum.	Total.	Reactors.	Reactors per Centum.
0 to 4	4	0	—	1	—	—	94	5	5.3
5 to 9	76	9	10.5	187	34	18.2	177	16	9.0
10 to 14	129	29	22.5	682	146	21.4	110	20	18.2

¹ After Anderson (Sydney), 1939.

In America a similar type of survey shows that an average of 60% of nursing trainees are reactors. In Australia conditions are even more strikingly different. In Sydney in 1939 Douglas Anderson conducted a very comprehensive Mantoux survey,⁽²⁾ and in his group of trainee nurses between the ages of twenty to twenty-four years there were only 52% reactors. Expressing this in similar terms to the Prophit survey conclusions by the time adult life is reached, only 52% of our population are Mantoux reactors, which after all is very different from 80% and is a finding of which very considerable diagnostic use can be made, particularly for exclusion as well as diagnostic purposes in young adults and children.

In other States of Australia similar surveys on trainee nurses have given similar results. At the Perth Children's Hospital from March, 1945, to June, 1946, 153 trainee nurses of an average age of nineteen and a half years have been tested with a result of 53% reactors and similar figures have been obtained in our other hospitals in this State, for example, Perth and Wooroloo.

Having reached the conclusion that between 50% and 55% of our population are Mantoux reactors on reaching adult life in this State as well as in others, our attention is next turned to the reaction in children.

TABLE III.²

Age in Years.	Total.	Reactors.	Percentage.
0 to 4	8	2	25
5 to 9	70	12	17
10 to 14	58	13	22.4

² After Penfold (Melbourne), 1923.

In June, 1945, Dr. H. K. Fry published the results of a Mantoux survey amongst Adelaide school children from the ages three to sixteen years.⁽³⁾ In order to compare these with our own age group Dr. Fry's figures have been analysed to show that of 972 children from the ages of three to thirteen years less than 8% are reactors (Table I).

The chart shows a fairly even distribution of numbers in the age groups; even when the age group thirteen to sixteen years is added the results show only 8.6% reactors. This figure of only 8% reactors is the lowest that has yet been recorded so far as I am aware, except for selected groups. Now Adelaide has had a very active tuberculosis propaganda campaign in progress for more than ten years, and it appears that these figures must reflect some measure of success at least.

In Douglas Anderson's survey in Sydney in 1939 a large series of children were included; these comprised 1,460 children from orphanages, schools and hospitals. His results were similar whether the children were hospital inmates or not (Table II).

A small survey by Dr. Penfold in 1923 at the Melbourne Children's Hospital is included⁽⁴⁾ as an index of reactors there; the series, however, is too small and lacking in details to be of much value—the high percentage in the 0-4 group is almost certainly due to selection of cases (Table III).

At the Perth Children's Hospital a survey has been made by performing a Mantoux test on every child admitted between February, 1946, and June, 1946. In this way 1,069 consecutive unselected patients were tested; a number

in excess of this figure were discharged (or died) prior to the reading of the test (Table IV).

Among these 1,069 unselected patients there were 249 reactors, that is, 23.3%. When divided up into age groups comparable with other surveys, the findings expressed as percentages are tragic. No matter how they are viewed or what possible extenuations are made, it is quite obvious that the incidence of reactions is grossly excessive and that the children are being exposed to an abnormal risk of infection, probably excessively frequently. The reaction rate of the upper age group 10-13 has already reached an adult level, so that it is very suggestive that our percentage of reactors is rising as these children approach adult age.

Extenuations are possible; for example, low economic level and inclusion of a number of cases of fresh tuberculosis in these figures *et cetera*.

This talk is not intended to be instructive as to the actual pathogenesis of tuberculosis, but to place before

TABLE IV.

Age Group.	Number of Cases.	Reactors.	Reactors Per centum.
Birth to six months	66	—	—
Six months to 1 year	114	3	3
1 to 2 years	151	8	5
2 to 3 years	114	9	8
3 to 4 years	85	17	20
4 to 5 years	93	21	23
5 to 6 years	79	24	30
6 to 7 years	66	23	35
7 to 8 years	61	25	40
8 to 9 years	55	24	44
9 to 10 years	42	16	38
10 to 11 years	54	30	56
11 to 12 years	42	25	59
12 to 13 years	47	24	51
Total ...	1,069	249	23.3

you the results of a Mantoux survey performed locally and to compare these findings with others. Table V shows the findings at the Perth Children's Hospital in age groups so that they may be compared with Tables II and III.

There are, however, a few comments to be made before discussion. Firstly, a Mantoux reaction indicates that the individual has been rendered hypersensitive to tuberculin through infection (or possibly by vaccination with attenuated or dead bacilli). Secondly, a reaction does not provide any certain evidence regarding the extent of the infection or the degree of activity, but it is necessary to remember that even inactive lesions may hold live bacilli which are a potential danger. Thirdly, in the case of infants and young children, a reaction in the presence of consistent clinical signs and symptoms is strongly suggestive of active tuberculosis. Fourthly, a strong reaction indicating a high degree of sensitivity does, in the presence of consistent clinical signs and symptoms, suggest active tuberculosis. Expressed in a different way, that is to say: "In the presence of clinical evidence of tuberculosis a strongly positive reaction must be considered as confirming a diagnosis of active tuberculosis until the condition is proved otherwise." Fifthly, failure to react to an adequate testing dose is always diagnostically exclusive in the presence of clinical signs and symptoms which do not manifest a gravely ill and practically moribund patient, that is "fallacious negative Mantoux".⁽⁵⁾

Discussion.

These features are summed up by the statement that the Mantoux test is an extremely useful but much neglected diagnostic aid, even in adult life.

There have been many arguments as to the advantages and disadvantages of developing a Mantoux reaction; there are several aspects to be considered now that it is established that 50% to 55% of the population reach adult life without becoming reactors and 20% remain non-reactors for life. To my mind, the most important is that it is a risk to be exposed to a tuberculous infection which will produce a very doubtful asset; it has been shown that in addition to the actual mortality involved with the primary infection, there is a very obvious morbidity in the case of cervical adenitis and bone tuberculosis as seen at a children's hospital. Surely we

TABLE V.

Age in Years.	Number of Cases.	Reactors.	Reactors Per centum.
0 to 4	623	58	9.3
5 to 9	503	112	37.0
10 to 14	143	79	55.2

have advanced beyond the belief that it is better to obtain immunity to infection by risking the disease itself than to take steps to avoid the disease entirely. In addition to this the individual who has gained his hypersensitivity harbours a lesion from which it is possible to obtain virulent organisms for a considerable time, so that the possibility of his encountering some other debilitating disease, usually an acute infection, which may lead to a breakdown of the tuberculous focus, must be considered.

In concluding my remarks, I wish to emphasize the fact that the incidence of tuberculosis in this State is excessive and a reflection on the failure of the medical profession to instigate an anti-tuberculosis campaign as Adelaide has done. The failure is reflected in the comparative figures of reactors in the two places. By an active anti-tuberculosis campaign I do not just mean improving the methods *et cetera* of diagnosis and treatment, but that of educating the people themselves about the prevalence of the disease, the following up of contacts and the search for the sources of infection and the prevention of further infections from these sources. In the past the diagnosis and treatment have been comparable with those of other States, but the control of the spread of the disease has been and still is grossly inadequate as evidenced by this survey. The education of the people lies in the hands of those in active medical practice who come into direct contact with the family unit, for it is there that the infection proliferates and so must be attacked firstly by explanation. To many it may not seem justified to say to the parents of a child who has reacted to the Mantoux test: "Your child has contracted tuberculosis which may not be active, but there are only two sources of infection, the family contacts and the milk supply." If the members of the household are healthy, then unboiled milk must be blamed. Even if this is a hasty and dogmatic statement to make to parents, it is justified if only they are made tuberculosis conscious.

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Reports of Cases.**TRAUMATIC RADIO-HUMERAL SYNOVITIS.**

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With Pathological Reports by C. H. SHEARMAN, M.B.,
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THIS paper is a sequel to a previous communication (*THE MEDICAL JOURNAL OF AUSTRALIA*, March 25, 1944, page 273). A further ten cases are reported in which satisfactory results followed operation, together with pathological reports by Dr. C. H. Shearman on microscopic sections of the fringes removed at operation. The pathological findings appear to be consistent with my contention that trauma of the synovial fringe is the basic aetiological factor underlying radio-humeral synovitis.

Case VIII.

H.V.W., a male patient, aged forty-one years, was first examined in May, 1944. He gave a history that in the previous November his left elbow had been hit by the moving arm of a delivery extension while he was leaning on his hand with a bent elbow. In spite of having been treated by physiotherapy, mainly short-wave therapy, he still complained that he was unable to work, particularly because of pain on gripping with his hand. Examination revealed tenderness along the radio-humeral joint line. Operation was advised, and a large thickened fringe was removed on May 9. After an uninterrupted convalescence, he returned to work on June 7. He has continued to work without any recurrence of symptoms.

Pathological Findings.

Microscopic examination of the fringe revealed an increase in the amount of fibrous tissue present, which was more conspicuous in the villus-like projections of the synovial fringe. Some small cell infiltration was present to a limited extent.

Case IX.

D.M., a male patient, aged thirty-four years, a keen tennis player, complained of a painful right elbow over a period of five months; the condition had become progressively worse, to such an extent that he was unable to play tennis. He complained particularly of pain on serving and on mistiming a backhand stroke. Beyond the fact that the condition came on while he was playing tennis, he had no recollection of a causative injury. Acute tenderness was present over the radio-humeral joint line, particularly when the limb was in flexion. On May 26, 1944, a thickened synovial fringe with a triangular projection into the joint about its centre was removed. This projection gave an appearance similar to the free marginal tear which is seen with a meniscus in the knee joint. Convalescence was uninterrupted and symptoms were completely relieved.

Case X.

W.C.L., a male patient, aged forty-four years, following the occupation of a ship's cook, was examined in June, 1944. He stated that about eighteen months previously, while throwing a tin of rubbish over the side of the ship, he had hit his elbow on a rail. This mishap was followed by acute pain. He had been continuously under treatment until I examined him, as he had been fortunate in having the advantages of a hospital ship at his disposal. His treatment had consisted in manipulation, strapping, massage and diathermy, and the elbow had also been put in a plaster cast. He complained that his elbow had not improved and that he was unable to lift a weight and was not able to carry on with his work. Tenderness was accurately localized to the radio-humeral joint line, particularly in flexion. When the fist was closed, movements of the joint produced grating of the teno-synovitis type. At operation on July 7, a thickened synovial fringe

was removed. This procedure was followed by complete relief of symptoms, and he was considered fit to resume work on August 25.

Pathological Findings.

Microscopic examination revealed thickening of the whole fringe and increased fibrosis. Villus-like projections were absent, but a few endothelial cells were present along the free edge.

Case XI.

L.A.W., a male patient, aged forty-four years, a labourer, was examined in June, 1944. About three weeks previously, while pulling out a jack pick, he had hit his left elbow against a wall. He complained that the elbow had since been painful and that he was unable to work. Tenderness was localized to the joint line, particularly when the limb was in flexion. After an unavailing fortnight's rest, in view of the short history operation was carried out on July 12, and a thickened synovial fringe was excised, with relief of symptoms; an uninterrupted convalescence followed. He returned to work on August 18.

Pathological Findings.

Microscopic examination revealed fibrosis in the fringe and in the villus-like processes.

Case XII.

The case of E.J.W. was described in the previous paper under Case VII. E.J.W. stated that his left elbow had been completely satisfactory since the removal of the synovial fringe and had given him no further bother. When examined in April, 1944, he complained that he had over-extended his right elbow while using a pump a few days before. Seven days later he was using a sledge hammer and wedges, splitting wood, when the elbow became painful. Tenderness at that stage was present over the origin of the forearm extensor muscles, and a sprain of these muscles was thought to account for his condition. He was not seen again until October in the same year, when he stated that he had had to cease work in June owing to the pain in his elbow, and that the limb had then been treated by immobilization in plaster for six weeks, followed by short-wave therapy and massage, which he said aggravated his condition. He still complained that he was unable to lift or carry with his right arm, and he localized the tenderness to the radio-humeral joint line, particularly when the limb was in the flexed position. It was my impression that I could then feel a thickened synovial fringe. Operation was advised, and the thickened synovial fringe was removed. This procedure was followed by complete relief of symptoms and a return to work the following month. This patient is of the apprehensive type, and on these grounds some hesitation was felt in operating on his second elbow. Apparently a satisfactory result has justified this procedure.

Pathological Findings.

Microscopic examination showed the fringe to be densely fibrous, and in the villus-like processes also fibrosis was seen. Some small cell infiltration was present beneath the endothelial layer of the free edge.

Case XIII.

The case of R.F.H. was described in the previous paper under Case I. He was again examined in January, 1944, when he stated that his left elbow had remained symptomless and expressed complete satisfaction with the result of the operation. He said that in October, 1943, he had fallen from the side of a motor lorry, saving himself by gripping the rail of the lorry as he fell, and injuring his right elbow. In December he was knocked over by a motor truck, while lifting a bag of cement onto a concrete mixer, and again injured his elbow. In the beginning of January he fell while crossing a railway line, suffering a further injury to the same elbow. He complained of pain on gripping and of tenderness over the lateral epicondyle of the humerus. He was thought to have suffered a sprain of his extensor muscle origin, and a local anaesthetic injection was given into this area without relief. A week

later creaking of the teno-synovitis type could be felt on opening and closing of the hand, over the upper half of the extensor muscle. His elbow was then fixed in plaster; this relieved his pain, but within a week a plaster rash had developed, necessitating removal of the cast. His arm was then put into an elbow cage, limiting extension, and gradually some improvement took place. By the beginning of March, crepitus had disappeared and the elbow was comfortable in the cage; but his grip was weak. Towards the end of April the cage was removed, and he again complained of pain on extension and on gripping. Grating had now disappeared. At the end of May he resumed light work. In September he complained that after digging some soft soil his pain recurred, particularly on extension of the limb, and on gripping. Tenderness was present over the radio-humeral joint line in the fixed position, and a synovial fringe could be felt. Crepitus was not present and the extensor muscles were no longer tender.

In view of the satisfactory result from the operation on his left elbow, this patient was anxious at this stage that a similar operation should be carried out on the right side. This was agreed to, although it was thought that the story was somewhat atypical, particularly in view of the crepitus which had been present in the earlier stages; this suggested that the condition was more intermuscular than intraarticular. At operation, carried out on September 11 a fringe was removed, which did not conform to that usually seen, in that it was comparatively thin and appeared to be what one would expect of the normal synovial fringe. The subsequent immediate progress was satisfactory, and the patient resumed light work a fortnight later. Since then his elbow has not been troublesome except when he attempts hard work, such as digging, when he has a recurrence of the pain. He is able to carry on with the light work which is his normal occupation, but states that the operation on this elbow has not been so satisfactory as that on the left.

Pathological Findings.

Microscopic examination revealed some proliferation of the endothelial cells; these tended to form small aggregations. Elsewhere the villous processes were thickened and fibrous.

Case XIV.

T.S., an enthusiastic trout fisherman, complained that his right elbow had become painful during his Christmas fishing holiday in 1943. The pain had persisted, and when I examined him in March, 1944, he had an area of localized tenderness over the lateral epicondyle of the humerus; into this a local anaesthetic agent was injected in the belief that his condition was of sprained extensor origin. This procedure was not followed by relief, and the elbow was strapped over a pad, again without relief. On November 3 his elbow joint was opened and a considerably thickened synovial fringe was removed. Clinically at this stage he had some muscle wasting and tenderness localized to the joint line, particularly when the limb was in flexion, and a thickened fringe could be felt. On November 6 he returned to his duties as a busy medical practitioner and has carried on since that time with very little discomfort, except during the first few days. He fished again during the last Christmas holidays without trouble from his elbow, and has expressed complete satisfaction with the result.

The patient drew my attention to the persistence of the pain in the elbow joint, stating that he was even conscious of it while asleep. On questioning other patients, I found that this semiconsciousness of pain was more or less constantly present.

Pathological Findings.

Microscopic examination showed the villus-like processes to be thickened and fibrous, and dense fibrous tissue was present in other parts of the fringe.

Case XV.

E.O'B., aged thirty-six years, was a theatre sister. This patient complained that in the beginning of November,

1944, she bumped her right elbow on a plaster trolley. Three days later the pain was sufficiently acute for her to have the elbow radiologically examined. By January she found that she was unable to carry on with her duties, and complained of pain and tenderness over the radio-humeral joint, particularly when the limb was in flexion. A thickened synovial fringe could be felt. Operation was carried out, and a moderately thickened fringe was excised. This procedure was followed by an uninterrupted convalescence and by complete relief of symptoms. The patient is again working as theatre sister, without discomfort.

Pathological Findings.

Microscopic examination revealed some small cell infiltration along the free edge of the fringe; but the fibrosis noted in other cases was not a conspicuous feature.

Case XVI.

W.H., aged sixty years, was examined in February, 1946, when he gave a history of having knocked his right elbow on an open door while pulling out a chair from under a desk. This accident was followed by pain, and prior to being examined by me, he had been treated with hot air and by manipulation. He stated that manipulation increased his pain considerably, and that the pain was so acute that although he was advised to undergo further manipulation, he was not prepared to accept this form of treatment. He complained that he was unable to lift a teapot, and that he could not work. A thickened synovial fringe could be felt, which was acutely tender, particularly when the limb was in flexion. About 5° of limitation of extension were present. This man also stated that he was conscious of the pain during sleep. Operation was advised and carried out on February 19, when a considerably thickened synovial fringe was removed. This procedure was followed by a complete relief of symptoms, an uninterrupted convalescence and a return to work on March 19. During his convalescence, he exercised his elbow gardening and playing bowls, which he had not previously been able to do (to his considerable discontent, as he was an enthusiastic bowler).

Pathological Findings.

Microscopic examination revealed considerable small cell infiltration both along the free edge and in the deeper parts of the fringe. One long villus-like process was noted which showed fibrosis and small cell infiltration.

Case XVII.

R.M.M., a male patient, aged forty-seven years, was a farrier. He was examined on March 22, 1945, and gave a history that while he was shoeing a horse about two years previously, his right elbow was knocked against a post. Since that time the elbow had been intermittently troublesome, and about two months before he was examined it was sufficiently painful for him to be off work for about seven weeks. He complained of pain localized to the radio-humeral joint line posteriorly, aggravated by flexing and extending the joint, and particularly on gripping. These movements produced a fine type of crepitus, of which the patient was conscious. He complained also that the painful elbow disturbed his sleep. On examination of the elbow, tenderness was accurately localized to the joint line, and a thickened, tender synovial fringe could be felt when the limb was in the flexed position. Operation was advised and carried out the following day. The synovial fringe removed was thickened in its antero-lateral part and appeared oedematous in this region. Convalescence was uninterrupted, and he was considered fit to resume his work on April 9, 1945. Since that time he has had no further trouble with the elbow joint.

Pathological Findings.

Microscopic examination revealed some scattered small cell infiltration, but fibrosis was not conspicuous, and the degree of inflammatory change appeared to be less than in most of the other cases.

Clinical Features.

Additional clinical features have been noted in the investigation of these cases. Pain is still the outstanding symptom; this statement can be elaborated as a result of the observation made by T.S., who drew my attention to the fact that even in his sleep he was conscious of the discomfort in his elbow joint. Several other patients on being questioned had noticed this symptom. Gripping almost constantly produces pain, and a frequent complaint is the inability to lift a teapot. As to clinical signs, I have found that in an appreciable percentage of cases, the thickened synovial fringe can be felt to be extruded from between the radial head and the capitellum, as the elbow is flexed, and pain is most acute when pressure is made over the joint line with the limb in the flexed position. I regard this sign as pathognomonic of the lesion.

In two cases (Cases X and XIII) creaking of the tenosynovitis type was present. In the former, this occurred only with the closed fist on flexion and extension of the joint; it was not present when the hand was open. This suggested that approximation of the two bones produced a synovial grating, similar to that felt with a thickened synovial membrane in the knee joint. In the second of these two cases, the creaking was more along the extensor muscles in the upper part of the forearm, and in view of this considerable doubt was felt that the lesion was intraarticular.

In one case (Case XVI) there were about 5° of limitation of extension, and in this case at operation a particularly thickened fringe was found to be present. Limitation of movements would appear to be unusual and apparently unrelated to the length of time during which the lesion has been present; this man's condition had been in evidence for only three months, whereas other patients, in particular T.S., had had the condition for almost twelve months. This man, however, had been subjected to manipulation of the joint, and may thereby have suffered comparatively severe trauma, with consequent additional thickening of the fringe. Manipulation would not only appear to be valueless, but even harmful, quite apart from the distressing exacerbation of pain which follows it.

Aetiology.

With the exception of two cases (Cases IX and XIV), the condition followed direct trauma in the region of the joint. In all apparently the trauma occurred when the limb was in the flexed position, with the hand more or less fixed. This again suggests compression of the synovial fringe, or trauma to the peripheral base of the fringe which is no doubt extruded from between the bones when the limb is in the flexed position. T.S., an enthusiastic trout fisherman, developed his symptoms while using his rod, apparently without any single injury. D.M. was a keen tennis player, and again the condition was of gradual onset related to his tennis playing.

Treatment.

Excision of the synovial fringe appears to be eminently satisfactory, and the patients are certain on the day following their operation that the original pain in the elbow has completely disappeared. I regard this attitude as being of considerable importance in evaluating the correctness of the operative procedure. Loss of the original pain is well recognized as a criterion of a successful result in other surgical conditions—for example, appendicitis—and as an estimate of the adequate reduction of a fracture.

I am even more convinced that such procedures as manipulation are not only valueless, but even harmful (note Cases X, XIII and XVI). W.C.L. (Case X) suffered his injury whilst on the staff of a hospital ship, and during eighteen months of treatment had received manipulation, plaster, immobilization, massage and diathermy without avail. It is, however, equally important that a correct diagnosis should be made prior to the performance of arthroscopy. No doubt a percentage of injuries around the postero-lateral part of the elbow joint have a tendinous or muscular aetiology. Sprains of extensor muscle origin I find readily respond to local anaesthetic injection,

and I do not hesitate to carry out this simple procedure if I am at all doubtful about the localization of the lesion. It is sometimes difficult to be dogmatic, particularly in the early stages, owing to the fairly diffuse spread of pain or discomfort, or both. After the lesion has been present for a few months, however, localization is seldom difficult.

RUPTURE OF AN ABDOMINAL ANEURYSM INTO THE ALIMENTARY CANAL.

By J. B. CLELAND,

Marks Professor of Pathology, the University of Adelaide.

RUPTURE of an aneurysm of the abdominal aorta into the alimentary canal seems to be a relatively rare event. In 1944 H. R. Pratt-Thomas⁽¹⁾ described three cases and J. Edgar Morison⁽²⁾ one more. Both these authors give an historical review of previous cases recorded in the literature. Pratt-Thomas found that only 538 cases of abdominal aneurysm had been described before he reported his three cases, and that in only 38 of these had rupture occurred into the stomach or intestines. In the 41 recorded cases, including his own three, the rupture had been into the duodenum in 32 instances. The chief symptom was pain, usually severe and constant, situated in the abdomen and back. Interference with the functions of the alimentary canal was sometimes evidenced by indigestion, constipation, nausea and vomiting. Pratt-Thomas states that in a moderate number of cases an abdominal mass was noticed, and this, together with the presence of an expansile pulsation with bruit and thrill, was diagnostic of an abdominal aneurysm. Pressure effects on the ureter, the blood vessels, the common bile duct or even the duodenum might be present. In Edgar Morison's case also the rupture took place into the duodenum; this raised the total to 33 of rupture of an abdominal aneurysm into this organ.

A recent example of rupture of an atheromatous aneurysm into the duodeno-jejunal junction, which occurred at the Parkside Mental Hospital, seems worthy of record in consequence of the comparative rarity of this necessarily fatal condition.

Clinical Record.

A woman, J.C., aged sixty-five years at death, had been admitted to the Parkside Mental Hospital in September, 1939, suffering from chronic delusional insanity. At 8 o'clock on April 7, 1940, she collapsed and had a profuse haematemesis followed by some further vomiting of blood and some melena. A pulsatile tumour was present in the epigastrium. Six days later she suddenly had an epileptiform seizure, in which urine was passed freely into the bed. The lip was bitten, and she died in a few minutes with bright blood issuing from her mouth. Her blood serum and cerebro-spinal fluid had failed to react to the Wassermann test.

At the post-mortem examination, one and a half inches (3·7 centimetres) above the bifurcation of the abdominal aorta was an aneurysmal dilatation two inches (five centimetres) in diameter, extending upwards and to the right, with the duodeno-jejunal junction adhering to it on its left. Pronounced scoliosis to the right above and to the left was present in the dorso-lumbar region, so that the abdominal aorta had a curved course to the left. On the jejunal side of the junction was a wide opening one inch (2·5 centimetres) long into a clot which partly filled the aneurysmal dilatation. The jejunum for fifteen inches (37·5 centimetres) was filled with blood clot which formed a cast of the gut, the rugae appearing like the belly scales of a snake. Melena stools were present in the large intestines; the stomach was considerably distended with blood clot, part of which was foaming with bubbles of gas produced *post mortem*. There was much atheroma with ulceration of the abdominal aorta and the iliac arteries, and another aneurysm the size of a large almond was present two inches (five centimetres) above the first. No

syphilitic aortitis was obvious in the ascending aorta on macroscopic examination. Microscopic examination of the abdominal aorta revealed much atheroma with cholesterol crystals. A few cellular accumulations were noted in the media, but the condition was considered as being purely atheromatous. This view was supported by the negative response to the Wassermann test.

References.

⁽¹⁾ H. R. Pratt-Thomas: "Aneurysm of the Abdominal Aorta with Rupture into Duodenum", *American Journal of Clinical Pathology*, Volume XIV, Number 7, July, 1944, page 405.

⁽²⁾ J. Edgar Morison: "Rupture of Aortic Aneurysm into the Duodenum", *British Medical Journal*, August 19, 1944, page 244.

Reviews.

RADIOLOGY OF THE ALIMENTARY TRACT.

A SMALL handbook entitled "Roentgen Diagnosis of Diseases of the Gastrointestinal Tract", by John T. Farrell, junior, has been received from Charles C. Thomas, of Illinois.¹

This book is based on a series of lectures on the subject given by the author during his years of practice. The book is arranged methodically, and it should serve well, as its author states, as a handy manual for the advanced student and for the occasional radiologist; it is not intended as a book of reference for the senior radiologist.

The various sections of the alimentary tract are dealt with in order, and the general arrangement is very good.

The attempt to introduce the so-called "Standard Classification Nomenclature of Disease" of the American Medical Association (edited by E. P. Jordan) is rather advanced for this type of work, as in practice it could be carried out only with the assistance of a clerical staff. This would be rather difficult in the usual consulting practice. The work covers practically all the conditions met with in practice, and for the lecturer in radiology it should be of the greatest value. The various pathological conditions are described clearly and the accompanying illustrations are excellently chosen. In the section on the colon it is noted that the enema is introduced with the patient in the prone position; it is more usual to have the patient recumbent, so that palpation can be carried out while the enema is flowing; however, the patient is reversed after the injection and palpation is carried out in various positions.

This manual is well worth study and is a valuable addition to the modern radiological library.

EARLY AMBULATION.

"EARLY AMBULATION AND RELATED PROCEDURES IN SURGICAL MANAGEMENT", by Daniel J. Leithauer, is a very complete account of the subject as nominated in the title.² Following surgical interference, most surgeons rely on rest to aid the body in recovering from the effects not only of the operation, but of the disease that led to the operation. In this book a new concept is presented, in which the main feature is the early assumption of ambulation; this is instituted as soon as the patient has recovered from the anaesthetic. The book opens with a survey of the development of this new concept and ends with a list of answers supplied to a questionnaire, by patients who had been subjected to early ambulation after major surgery, the majority of whom seem very satisfied with this new type of treatment.

As an aid to the efficiency of his methods the author describes carefully planned abdominal incisions, designed to retain the natural strength of the structures, and he also uses special suture techniques, in which alloy steel wire is the main material used for suturing structures in which a strong union is necessary. The statement is made that the main disadvantage of such sutures is their inelastic properties. This fact means that the strain that must be put on

¹ "Roentgen Diagnosis of Diseases of the Gastrointestinal Tract", by John T. Farrell, M.D.; 1946. Springfield, Illinois: Charles C. Thomas. 9" x 6", pp. 281, with many illustrations. Price: 30s.

² "Early Ambulation and Related Procedures in Surgical Management", by Daniel J. Leithauer, M.D., F.A.C.S.; 1946. Springfield, Illinois: Charles C. Thomas. 9" x 6", pp. 246, with illustrations. Price: \$4.50.

supporting structures is concentrated along this rigid suture line, and with the patient moving about only a few hours after operation, this must be very considerable and could conceivably lead to the tissues giving way. One series of illustrations shows a woman rising from her bed and walking only eight hours after she had been subjected to Cæsarean section. To this it can only be said that most women whose confinements were normal would not be asked to do this so soon after delivery, let alone those whose babies had been snatched from them by this major surgical method, which is almost invariably associated with mental and physical trauma.

The author describes the illness that accompanies an abdominal surgical procedure as a "laparotomy syndrome", consisting of pathological functional changes caused by the surgical trauma. These changes occur largely in the respiratory and circulatory systems, and to a lesser extent in the other body systems, and the methods of exercises and movements are all designed to overcome these changes. By such methods the patient is said to make a quicker and less eventful recovery and wound healing is said to be accelerated. In over a thousand cases of appendicectomy cited (excluding ruptured appendix cases) the average period of post-operative hospitalization was approximately 2·25 days, while in a series of 180 cases of cholecystectomy the period was only 7·4 days. The author quotes the economic advantages from such short stays in hospital, and while this must be so, it would appear that the fact that the patient has to overcome not only the inroads of surgery, but also the general constitutional upset that led to operation, is to a large extent overlooked. However, no matter what may be the views of any surgeon, there is much food for thought in this book, for it gives a very clear and complete picture of this new concept of post-operative treatment. It is a long time now since Hilton wrote his famous "Rest and Pain" in which rest is the main feature of treatment for disease, and yet this is still widely read. It is too soon to tell whether the principles advocated in this new book will replace those enumerated by Hilton, but it can be said with certainty that time will tell.

GROUP PSYCHOTHERAPY.

"GROUP PSYCHOTHERAPY", by J. W. Klapman, gives a clear and well-balanced account of this subject.¹

The book commences with a brief history of group psychology. It is the story of how groups of people can be influenced—in olden times by war leaders or peripatetic teaching, in recent years by physicians managing persons suffering with tuberculosis, hypertension or mental disorder.

The next chapters give an account of the biological development of the family unit and how such units combine to form groups of varying size. The influence and importance of these units, the social structure, on the individual are emphasized. The behaviour of groups of people is examined with the way in which these groups react to different types of leadership. The application of these general principles to the treatment of mental disorders is then elaborated.

The group can be approached in many ways—by psychodrama (the acting out of their disorder), by lectures of all types, by discussions or by measures with an emotional appeal. These methods can be used for groups of patients in private practice, for children and their parents, in out-patient departments or in mental hospitals. The size of groups and the material used for each group are examined.

The author outlines the material he uses for a course of lectures or talks. These lectures serve to give the patient an understanding of why he is ill, what mental sickness is, how the mind functions, what the personality is, how we think and how we should react to our environment.

The author gives a reasonable perspective of the place of group psychotherapy in relation to other measures used for treating mental disorders. The impossibility of giving figures on the results of group psychotherapy is stressed. But certain general advantages of this method are instanced.

For the doctor it may save time. This saving of time is most obvious if one is treating groups of patients with a common attribute such as soldiers under battle stress or persons of a similar intellectual level.

For the patient, group psychotherapy brings a realization that many persons have a similar problem. It also gives the patient practical help in his return to a place in the social life of the community.

¹ "Group Psychotherapy: Theory and Practice", by J. W. Klapman, M.D.; 1946. New York: Grune and Stratton. 9" x 6", pp. 352. Price: \$4.00.

For the community the lessons of group psychotherapy bear on education. The author suggests that modern educational methods give the individual little understanding of himself, his purpose in life or his environment. He states that the lack of this knowledge in the average patient is alarming. He hopes the results of group discussion will lead to a better understanding of what should be taught in education centres.

This book is written with a minimum of technical terms so that it can be read by any doctor. It will have most appeal to those interested in psychological medicine or sociology. Its therapeutic lessons will be most suited to psychiatrists working in mental hospitals, in child guidance clinics or lecturing on mental hygiene.

RADIOGRAPHY FOR THE BEGINNER.

A SECOND edition of a small book entitled "A Handbook of Radiography", by John A. Ross, has been received from H. K. Lewis and Company, London. The book compares unfavourably with others on the subject, especially in the illustrations of the various positions of the parts under examination. The subject matter is too condensed and approaches the "Do" and "Don't" method of presentation.

The book attempts too much in a small compass, and it would have been better if the reader had been referred to larger treatises on the subject of encephalography and arteriography and other intricate procedures.

The placing of poetic quotations (more or less inapt) at the head of each chapter is rather out of place, especially when a misquotation from Longfellow is given:

"The muscles on his brawny arms,
 Stood out like iron bands."

The recommendation of an opaque meal, consisting of four ounces of barium sulphate in a pint of bread and milk would be rather revolting to a dyspeptic person. The author's experience of miniature radiography of the chest must have been unfortunate, when he finds that miniature films show deficient detail. This modern advance could have been dealt with in greater detail. The section on the darkroom is quite good, but there is no description of the now universally adopted method of printing the patient's particulars on the film before development.

This book is disappointing and would be of help only to the beginner in radiography.

PRACTICAL ANÆSTHESIA.

THE second edition of J. Ross Mackenzie's little book, "Practical Anæsthetics", retains the admirable features of its precursor, published only two years ago.² The need for a new edition is evidence of the popularity and usefulness of the work.

The author is to be congratulated on the many improvements of both matter and style exhibited by his more recent effort. Several changes in arrangement, mostly advantageous, are apparent, and if here and there various minor errors persist, these are of no great significance. For instance, "bromethyl" on pages 10, 11 and 12 should be bromethol, and "sulphanilamides" on page 83 should be sulphonamides. Less pardonable are the continued references to "vagi nerves" on pages 29, 30 and 32, while assertions that the epiglottis may block the glottis and that ether is a heavy liquid, appearing on pages 32 and 35 respectively, are unacceptable. Distaste is also aroused by the remark about the "blood gases" on page 107, while the head harness which comes up over the cerebrum on page 138 implies a startling prevalence of serious cranial defects.

The first edition was given a long and favourable review in these columns on December 16, 1944, although numerous errors, both typographical and otherwise, were then pointed out. It is hoped that future editions will see the progressive elimination of these blemishes. Apart from these the work is a model of conciseness and lucidity, from which even specialists could derive much useful information.

¹ "A Handbook of Radiography", by John A. Ross, M.A. (Cambridge), M.R.C.S. (England), L.R.C.P. (London), D.M.R.E. (Liverpool); Second Edition; 1946. London: H. K. Lewis and Company Limited. 8½" x 5½", pp. 174, with many illustrations. Price: 10s. 6d.

² "Practical Anæsthetics for Students, Hospital Residents and Practitioners", by J. Ross Mackenzie, M.D., D.A. (R.C.P. and S., England), with a foreword by W. C. Wilson, M.B., Ch.B., F.R.C.S.E.; Second Edition; 1946. London: Baillière, Tindall and Cox. 8½" x 5½", pp. 184, with many illustrations. Price: 10s. 6d.

The Medical Journal of Australia

SATURDAY, JANUARY 11, 1947.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: initials of author, surname of author, full title of article, name of journal, volume, full date (month, day and year), number of the first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

THE REHABILITATION AND RESETTLEMENT OF DISABLED PERSONS.

A GREAT deal of the time of the last meeting of the Federal Council was taken up with a discussion on the rehabilitation of ex-service personnel with a disability not accepted as related to war service. In our report of the Federal Council's meeting there was included a summary of the plan which has been formulated by the Ministry of Post-War Reconstruction, and which formed the basis of an address to the Council by Dr. Douglas Galbraith, Commonwealth Coordinator of Rehabilitation. Attention was also drawn to a paper by Dr. Galbraith, "The Responsibility of the Doctor in Regard to Rehabilitation in Private and Hospital Practice", read by him to the Victorian Branch of the British Medical Association and published in this journal on July 6, 1946. It will be remembered that the Federal Council discussed the views put forward by Dr. Galbraith and appointed a subcommittee to draw up a plan for submission to its next meeting. From this it will be clear that rehabilitation of disabled persons is a subject that should engage the attention of medical practitioners both as individuals and also as members of the British Medical Association.

This subject is not new from the Federal Council's point of view. As long ago as August, 1943, the Council spent some time in considering a report prepared by a committee of the New South Wales Branch, in which the whole subject of the rehabilitation of injured persons was covered. The council was content to send the report to the Branch councils with the recommendation that it should be sent to superintendents of hospitals. A little later in the same year, in the issue of October 16, attention was drawn in these columns to an inter-departmental report published in Great Britain (it has since become known as the Tomlinson Report) on the rehabilitation and resettlement of disabled persons. The Tomlinson Report aroused a great deal of interest in Great Britain and in other countries; a long account of it was given

in the *International Labour Review* of July, 1943. In our analysis of the report special attention was paid to its philosophical basis, and in reference to the New South Wales Branch report it was stated that the Federal Council had done little more than touch on the fringe of the subject. The suggestion was made that the Council should approach the problem again with a broad conception of its meaning and that it should recommend to the Federal Government that the subject should be studied from the Australian point of view by a body similar to the committee which drafted the Tomlinson Report. This was not done. Instead, the Commonwealth has created its own machinery for rehabilitation and the Federal Council has in effect asked a subcommittee to traverse the ground that was covered by the New South Wales Branch more than three years ago.

Though the Federal Council has preferred to proceed in this matter with what many will regard as undue caution, the members of the Branches should be kept informed of progress that has been made in Great Britain. Shortly after the Tomlinson Report was issued a standing committee comprising representatives of the departments concerned was appointed in order to coordinate the work of the departments responsible for the scheme of the rehabilitation and resettlement of disabled persons and to secure some general supervision over its development and administration. This standing committee has now issued a report¹ giving an account of the steps which have been taken to implement the recommendations of the Tomlinson Report. The ministries concerned are those of Education, Labour and National Service, National Insurance, Pensions, and Health, together with the Scottish Departments of Health and Education, and the Government of Northern Ireland. The chairman is Mr. H. H. Wiles, deputy secretary of the Ministry of Labour. It is pointed out that matters coming under the heading of medical rehabilitation in the Tomlinson Report—and these are the matters of most interest to readers of this journal—either do not require separate legislation or will be covered by legislation necessary for the introduction of a national health service. Substantial progress has been made in the development of rehabilitation facilities in hospitals "and these will provide the foundation on which to build the provisions for hospital rehabilitation which will be required as an integral part of the new Health Services". In 1943 the total number of hospitals with all facilities for active rehabilitation was 48; in 1944 the number was 131; in 1946 it was 204. Some of these hospitals used their facilities only for selected disabilities, such as those resulting from trauma; these numbered 35 in 1943, 73 in 1944, and 121 in 1946. The number of hospitals with partial facilities (for example, facilities for remedial exercises, but none for occupational therapy) was for the three years 102, 136 and 129. What these figures mean can be gathered from the statement that the total for 1946 (333 hospitals) represents 71% of the 464 hospitals which were specially selected in 1943 by officers of the Ministry for Health as institutions at which rehabilitation departments should, if possible, be set up during the war years, or 64% of the 520 larger general and special hospitals in England

¹ Report of the Standing Committee on the Rehabilitation and Resettlement of Disabled Persons; Ministry of Labour and National Services; 1946. London: His Majesty's Stationery Office. 9 $\frac{1}{2}$ " x 6", pp. 20. Price: 4d. net.

and Wales at which the establishment of such departments might reasonably be expected. These figures are of interest when we read in an appendix to the report that the total number of registered disabled persons on August 19, 1946, was 628,638. (It is a statutory condition of eligibility for participation in resettlement or employment schemes that registration shall be effected, and registration has been going on since September 25, 1945.) Of the total number of registered persons, 289,906 are in a surgical group, 196,273 are in a medical group, 34,163 are in a psychiatric group, and 108,296 in a miscellaneous group comprising those with congenital malformations, eye and ear defects and so on. Of the total of 628,638 persons, 107,124 (18 of them women) were ex-service personnel of the 1914-1918 war; 273,460 (2,391 of them women) were other ex-service personnel; 243,167 (34,445 women) were not ex-service personnel; and 4,887 were juveniles. Attempts have been made to undertake special measures for persons suffering from cardiac disabilities, tuberculosis and deafness, for psychoneurotic persons and for miners who require rehabilitation. The attempt to set up special centres for cardiac patients was not successful, mainly because of staff difficulties. For tuberculous patients a scheme of maintenance allowances during treatment is now in operation. The tuberculosis authorities are reimbursed for their expenditure by the Exchequer. Arrangements have been made for the finding of employment under suitably adjusted conditions for the individual patient when he is thought to be fit to undertake it. There has, however, been more success in the finding of part-time employment than in the provision of rehabilitation measures. This is of particular interest to Australian practitioners in view of the conclusion stated at the last Federal Council meeting that Queensland was the only State in which satisfactory provision was made for the tuberculous in the matter of financial assistance. In regard to hearing aid clinics, the first step taken as a preliminary measure was a reference to the Medical Research Council for advice. The outcome was an announcement in June, 1946, on behalf of the Government, that a new and efficient hearing aid had been designed by the Electro-Acoustics Committee of the Medical Research Council. This hearing aid will play a part in the treatment of deafness in the new health services. In regard to psychoneurotic persons it was noted that the psychiatric services of the country were very unevenly distributed and also that there was need for more out-patient clinics. Two experimental assessment centres are to be set up, one in England and one in Scotland. For some persons no immediate solution will be found; for others employment may be possible and perhaps employment under sheltered conditions. For those coming under the last-mentioned category responsibility will rest with the Disabled Persons' Employment Corporation. The steps that are being taken for the rehabilitation of miners include the Gleneagles experiment undertaken in 1943 at the request of the Ministry of Fuel and Power and the Miners' Welfare Commission. This was described in these pages in the issue of July 13, 1946, in a discussion on a report of the Medical Advisory Committee for Scotland, issued by the Department of Health for Scotland.

The aspects that have been mentioned include the main features which have a predominant medical interest. At the same time it should be pointed out that work carried

out at the Egham residential industrial rehabilitation centre has shown that it is impossible to draw any precise line of demarcation between medical and industrial rehabilitation. "There is a stage in the process of converting a hospital patient into an active worker at which what he needs is mainly recuperative medical treatment coupled with occupational therapy, so as to enable him to regain the normal use of his bodily and mental capacities." In order that disabled persons may be placed in suitable employment and "followed-up" to ensure their satisfactory resettlement, what are known as disablement resettlement officers have been appointed at the local offices of the Ministry of Labour and National Service. Vocational training may be provided under the Act for all who need it; the list of courses provided is long and covers a wide range of occupations. Severely disabled persons are being provided for by the Disabled Persons' Employment Corporation, Limited (a company limited by guarantee and not having a share capital), which has been set up under the chairmanship of the Right Honourable Viscount Portal. This corporation has the power to create and develop employment facilities for the severely disabled where there is need of them. A programme of fifty of these "Remploy Factories" has been approved by the Minister for Labour and National Service and the first three of them were opened in the summer of 1946.

From the foregoing statement some idea may be gained of what is being done in Great Britain. Progress in such a colossal undertaking as rehabilitation must necessarily be slow because of the many factors to be considered and the many differing agencies that must find a common basis for action. Anyone who has any doubts about the truth of such a statement would do well to read the report on rehabilitation by a special committee of the British Medical Association published in the *British Medical Journal* of June 29, 1946. This document has been produced by a committee which began its inquiries in December, 1944. The summary of principles on which a planned rehabilitation service should depend is stated at the end of that report. It mentions unity of control at the centre, unity of control in the regions, cooperation between medicine and industry and the maintenance of close contact between hospitals, centres, homes *et cetera*. Included also is the need for effective liaison between all who are immediately responsible for the clinical conduct of the case—general practitioner, hospital staff and industrial medical officer. On this liaison the success of any rehabilitation service will ultimately depend.

Current Comment.

DROPLETS FILTERED OUT BY THE NOSE.

THE title of an article in the *Proceedings of the Royal Society*, London, "Filtration of Droplets in the Nose of the Rabbit" might possibly make the man in the street indulge in a contemptuous smile, but as so often happens, what arouses ridicule in the lay mind may well be an investigation of immediate practical importance.¹ In this inquiry, carried out with all the rigour of a research in physics, the nasal passages of the rabbit were examined

¹C. N. Davies: "Filtration of Droplets in the Nose of the Rabbit", *Proceedings of the Royal Society, Series B*, Volume CXXX, August, 1946, page 282.

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with respect to shape and dimension. Enlargements of photographs were subjected to a laborious measurement by planimeter; this was backed up by radiographs of the cavities filled with lipiodol. Rabbits were anaesthetized with intraperitoneal injection of "Nembutal"; an incision was made in the neck and the trachea was exposed and cut; one end, that which communicated with the lungs, was cannulated for respiration; the other served for the escape of air sent down the nose at regulated velocities. At first droplets of dibutyl phthalate were used, but as evaporation altered their diameters, Apiezon oil B was "atomised" with satisfactory results. The droplets were allowed to form a sediment on specially cleaned cover glasses and measured with every attention to accuracy. The anatomical structures chiefly involved were the maxillo-turbinals, the naso-turbinals and the ethmo-turbinals, but the brunt of the absorption fell on the maxillo-turbinals. Briefly put the results were as follows. Air-borne droplets down to a diameter of 7μ were filtered out by the moist nasal membranes; those from 1.5μ down to about 0.005μ which corresponds to an organic substance with molecular weight of the order of 10,000, passed freely into the lungs, whilst molecules of molecular weight below 500 were trapped. This may sound a paradox, but the explanation is simple. The larger droplets have an effective inertia and so will cut across the stream lines when these bend, overcoming viscosity. Thus the chances of being trapped increase with drop diameter. On the other hand when the particles are of molecular size the velocity of diffusion, which is negligible in the large droplets, comes into play and so these impinge upon the walls of the nasal passages. Just what factors operate in the capture of these small particles, which the author does not hesitate to call molecules, is not made quite clear—whether there is a high coefficient of solubility in the nasal moisture or whether colloidal forces are present. The author in all candour mentions the fact that the general plan of the nasal passages in the human being is much simpler than in the rabbit and so the figures given for the rabbit might not apply. This is highly probable, but nevertheless a most interesting principle has been enunciated, namely, the different roles of inertia and diffusion, and these must be operative in the human nose also. It is scarcely necessary to emphasize the importance of our knowing what infective material can enter the lungs and what is likely to be caught. One conclusion reached in this work on the rabbit is curious. "Owing to the low air speeds involved the partition of air between the upper and main channels would be governed by their relative resistances and not, it is thought, by the directive action of jets." Now it is well known that directive action plays a considerable part in the distribution of inspired air in the human nose, for should the external nose be lost by trauma or disease, olfactory acuity falls in a surprising manner, indicating that the upward rush of inspired air is necessary for proper contact with the Schneiderian surface. No doubt investigations similar to this made with the rabbit will be carried out on human nasal passages and the results are certain to have an immediate application to the study of infection through the respiratory tract.

A SERIOUS SUGGESTION IN LANGUAGE THAT IS NOT AUSTERE.

THE term *austere* has been applied to the kind of medical writing that appears in reputable medical journals. This implies that jargon is frowned upon and that facts are stated plainly in words that are commonly described as part of the King's English. There is no doubt that a certain sameness tends to develop in certain journals, and no doubt habitual browsers in medical literature could bring themselves without much trouble to recognize the source of editorial extracts presented to them for the purpose. A year or two ago we welcomed from a gifted Australian practitioner a skit on "current comment" as presented in this journal. Our author referred to *The Journal of Cynical Medicine* and discussed an apparatus for spraying the nasal cavities of mice. (See THE MEDICAL JOURNAL OF AUSTRALIA, April 17, 1937.) But the austere

writing of medical journals does more than eschew the use of jargon; it does not include slang or language of the lighter or more frivolous kind. This may or may not be regretted; but it is safe to say that over indulgence in the lighter touch would soon become boring. *The Lancet* has for some months delighted its readers with "A Running Commentary by Peripatetic Correspondents", under the title "In England Now". In the issue of September 28 one of these peripatetic persons refers to the "business" of German measles in the third month of pregnancy in relation to congenital defects. His suggestion is worthy of consideration, but his method of making it is so unusual that the temptation to quote his words cannot be resisted.

Our peripatetic person thought he would do some arm-chair research on adult disorders originating from events in infancy. He soon realized that much of the field "had already been scooped by a bloke called Freud". He then determined to out-Freud Freud and to go back further still. Then he writes.

Picture if you can an ovum, a fresh and blooming débâutante making her one and only appearance in utero. Alas, however, she differs from other protozoa in that she cannot split in the middle on her own and can only achieve immortality by the sacrifice of her unicellularity. Her chances of doing this are limited to the next forty-eight hours or so. If she has no spermatozoic suitors in that time, then she's had it. Now picture if you can an ovum in her forty-seventh hour. Her protoplasm is pickled, her genes are jiggled, her mitochondria are moth-eaten, and her cell-membranes are slipping up. Altogether, so far as ova go, she's a hag. Then suddenly there is a lashing of tails in the middle distance and a crowd of boys come charging up the slope. She gasps with relief. She shrieks with joy. She grasps the winner by the scruff of the neck before he can have a chance to see what he's landed with and change his mind. Perhaps it is in such a union that originate placebos and excuses which are yet undeniable truths—the "constitutional weakness", the "constitutional instability", the "constitutional predisposition".

Our peripatetic one adds: "Yes—I suppose it is rather far-fetched." What if it is? It is worth thinking about.

AN OVERSEAS PROFESSORSHIP IN MEDICINE AND SURGERY.

Advice has just been received from England that arrangements have been completed for the establishment of an Overseas Professorship in Medicine and in Surgery. The plan has been made possible by the provision of an endowment from a prominent New Zealand citizen who desires to remain anonymous, and who is making the gift as from "a New Zealand family". The annual income from the endowment is estimated at £2,000.

Under the terms of the endowment an Overseas Professor will be appointed annually by the Presidents of the Royal College of Physicians of London, the Royal College of Surgeons of England, the Royal Australasian College of Physicians, and the Royal Australasian College of Surgeons, who shall have power to coopt other members to the Appointing Board. The purpose of the endowment is to ensure a visit from a prominent physician, surgeon or scientific worker in Great Britain to Australia and New Zealand annually to give post-graduate lectures, and to carry out other post-graduate work in medicine and surgery. The Appointing Board will, however, be empowered to select someone from Australia or New Zealand to visit Great Britain, and they will also be empowered to require the Overseas Professor to visit other Dominions beside Australia and New Zealand.

The establishment of this professorship is a most important and noteworthy forward step in the provision of post-graduate educational facilities for medical graduates, and will be of the utmost benefit to medical graduates in Australasia. In addition it will cement the ties which unite the Royal College of Physicians of London and the Royal College of Surgeons of England with their sister Colleges in Australasia.

Abstracts from Medical Literature.

THERAPEUTICS.

Streptomycin.

D. R. NICHOLS AND W. E. HERRELL (*The Journal of the American Medical Association*, September 28, 1946) have submitted streptomycin to fairly extensive clinical investigation since September, 1944, and present a statement of their observations. They believe that streptomycin has a place in the treatment of certain bacterial infections. With few exceptions, the degree of sensitivity of microorganisms to the drug as determined *in vitro* can be used as an index of its probable therapeutic effectiveness. The authors found the following microorganisms to be sensitive to streptomycin: *Escherichia coli*, *Eberthella typhosa*, *Salmonella paratyphi*, *Salmonella enteritidis*, *Shigella dysenteriae*, *Proteus vulgaris*, *Aerobacter aerogenes*, *Pseudomonas aeruginosa* (*Bacillus pyocyanus*), *Klebsiella pneumoniae*, *Hemophilus influenzae*, *Hemophilus pertussis*, *Staphylococcus aureus* (some strains), *Mycobacterium tuberculosis*, *Brucella melitensis*, *Brucella abortus*, *Brucella suis*, *Pasteurella tularensis*, *Pasteurella pestis*. Satisfactory concentrations of the drug can be produced in the blood and urine by intravenous, intramuscular and subcutaneous administration. Streptomycin is not destroyed in the gastro-intestinal tract, and a large percentage of it can be recovered from the feces when it is given by mouth. However, when the drug is administered orally, it cannot be detected in significant amounts in the blood and urine. It may be administered locally by intrathecal injection and by instillation into various body cavities. It is fairly readily diffused throughout the body and is readily excreted in the urine; there is no evidence of a toxic effect on the kidneys. The usual dosage of streptomycin in the treatment of infections is 2,000,000 to 3,000,000 units (two to three grammes) per day. From clinical observations on two groups of patients, comprising respectively 104 and 88 subjects, the authors draw the following conclusions. (i) Streptomycin is of considerable value in the treatment of bacteremia due to Gram-negative organisms sensitive to its action. (ii) Streptomycin is of definite but limited value in the treatment of infections of the urinary tract, its effectiveness varying with the sensitivity of the organism present. Intensive treatment for a short time seems to yield the best results. (iii) Meningitis due to *Hemophilus influenzae* usually responds well to treatment with streptomycin; additional treatment with sulphonamides and antiserum may be indicated. (iv) Streptomycin appears to be of greatest value in the treatment of tularemia. (v) Streptomycin seems to have some value in the preparation of patients for pulmonary resection. Temporary or permanent eradication of sensitive microorganisms from the tracheo-bronchial tree may be achieved by its use. (vi) Temporary symptomatic improvement may follow the use of streptomycin in ozena. The authors will make no final statement on the value of the drug in the treatment of pulmonary and extrapulmonary tuberculosis. They point out that it has proved

of doubtful value in typhoid and paratyphoid fever, undulant fever, osteomyelitis, peritonitis and cholangitis. Organisms can develop resistance to streptomycin with great rapidity, and this fact has an important bearing on the clinical results following its use. No serious uncontrollable toxic reactions have followed the use of the drug in the series under discussion; but irreversible neurotoxic effects on the eighth cranial nerve may occur if treatment with it is prolonged.

Penicillin Reactions.

M. H. KOLODING AND E. DENHOFF (*The Journal of the American Medical Association*, April 20, 1946) describe penicillin reactions. Contact dermatitis in those handling and making penicillin, urticaria, asthma and cutaneous reactions have been reported. The authors report 124 patients who were given 20,000 units of sodium penicillin every three hours, by the intramuscular route. Twenty-one immediate and eleven delayed reactions were noted, more frequently in skin disorders. An exacerbation of the skin lesion was noted in seventeen patients with pruritus, hyperemia and exudation of serum. Pruritus and vesiculation of hands and feet were noted four times. Immediate reactions occurred within twenty-four hours of the start of treatment. Delayed reactions occurred from seven to fourteen days from the beginning of treatment. Swelling of joints, urticaria, pruritus, lymphadenopathy, joint pains, myalgia and malaise were noted. All subsided in four or five days. Positive results to intradermal tests were obtained with penicillin in the case of eleven patients who reacted abnormally. The reactions occurred with different brands of penicillin. It was not known whether the reactions were due to the penicillin itself or an impurity. Reactions have occurred with crystalline penicillin. In some cases in which penicillin was continued after reactions occurred, the reactions subsided in spite of continuance of penicillin therapy. Both ephedrine and adrenaline were of value in the relief of symptoms.

Anæmia.

J. OLIVER AND H. SARLES (*La presse médicale*, July 13, 1946) have reported two cases of severe anæmia of the pernicious type which responded to treatment with barm (*levure de bière*). The patients were men of forty and sixty-four years of age, giving a fairly typical history and blood picture of pernicious anæmia. Treatment with liver preparations was ineffective, but two soup spoonfuls of fresh *levure de bière* daily induced a rapid improvement and apparent cure so long as the treatment was continued. *Levure de bière* is described as barm or yeast, and is apparently the froth on the beer at certain stages of its preparation.

Effervescent Drugs.

G. LOLLI AND R. SMITH (*The New England Journal of Medicine*, July 18, 1946) discuss effervescent mixtures as adjuvants to the rapid absorption of drugs. Aspirin in doses of seven grains or more caused a delay in the emptying of the stomach of rats. In human adults there appeared to be no delay in gastric emptying with this dosage. It is well known that acids delay alkalis and hasten gastric emptying. Investigations by fluoroscopic examination after test meals and by determina-

tion of the level of the drug in the blood showed that by itself tartaric acid did not hasten emptying of the stomach, but that sodium bicarbonate alone or tartaric acid 1.5 grammes with 2.0 grammes of sodium bicarbonate in an effervescent mixture caused the stomach to empty more rapidly. This was due probably to liberation of carbon dioxide which occurred only when hydrochloric acid was present in the gastric juice. Sulphathiazole and acetyl salicylic acid were absorbed more rapidly after oral administration with alkalis. Absorption was most rapid and hence blood concentration more efficient when these drugs were given with an effervescent mixture of tartaric acid 3.0 grammes and sodium bicarbonate 4.0 grammes, or with sodium citrate 4.0 grammes, sodium tartrate 4.0 grammes or carbonated water 150 millilitres. The effervescent mixture was the more effective.

Intensive Salicylate Therapy in Acute Rheumatism.

R. C. MANCHESTER (*Archives of Internal Medicine*, August, 1946) states that therapy which succeeds in modifying the natural course of acute rheumatism offers an opportunity of preventing sequelae. He has investigated the effectiveness of salicylate therapy by the Coburn technique in accomplishing this objective. With this method patients are given 10.0 grammes or more of sodium salicylate every day. The drug is given intravenously for seven to fourteen days, followed by oral administration, or else it is given orally throughout the course of treatment. Treatment was continued until the blood sedimentation rate had remained normal for a period of two weeks. In none of a group of 38 patients treated by Coburn by this method did valvular heart disease occur, while in twenty of sixty-three patients receiving only symptomatic therapy physical signs of heart disease developed. The author has studied seventy-seven young men (naval personnel) afflicted with acute rheumatic fever, all of whom exhibited acute polyarticular arthritis as the major incipient manifestation. The author sets out his findings in detail. He concludes that intensive salicylate therapy suppresses rheumatic infection in the acute stages occurring in young adults when treatment is instituted within twenty-five days after inception of the acute infection. Acute articular and toxic manifestations are dramatically relieved. Cardiac residua are prevented if therapy is instituted before signs of significant carditis have appeared. Already existing acute carditis is favourably influenced, although residual stigmata are not necessarily prevented. The period of acute infection is materially shortened, and relapses and residual chronic infection, although not prevented, occur less frequently in patients receiving intensive salicylate therapy than in those receiving symptomatic therapy.

NEUROLOGY AND PSYCHIATRY.

Effects of Sedative Drugs on the Electroencephalogram.

MARGARET LENNOX (*The American Journal of Psychiatry*, May, 1946) set out to determine whether small doses of the commonly used sedatives could

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change the electroencephalogram from normal to abnormal, and whether such change occurred sufficiently often to become significant. The drugs used were phenobarbital, "Nembutal", "Sodium Amytal", "Seconal", chloral and paraldehyde. Patients known to be suffering from epilepsy or any organic brain lesion were excluded from the study. Data on forty-five psychiatric patients who had received oral sedation within twenty-four hours of the recording of the electroencephalogram were compared with those on a similar number of psychiatric patients who had received no sedative. The results showed that the commonly used barbiturates may change a normal to an abnormal electroencephalogram, whereas paraldehyde and chloral do not cause any prolonged abnormality. The change occurs in an estimated 35% of individuals with normal electroencephalographic tracings. It is believed that the factors which influence the appearance of abnormal electroencephalograms after sedation reside in individual susceptibility.

Psychoendocrine Relationships in Pseudocyesis.

ARTHUR STEINBERG *et alii* (*Psychosomatic Medicine*, May-June, 1946) report three cases of pseudocyesis, and present certain evidence of the effect of the psyche on the endocrine system. They consider that their demonstration of alterations in the excretion of gonadotropins and oestrogens as a result of psychogenic influences offers a more satisfactory explanation of the mechanism involved in pseudocyesis. In the three cases presented hormone assays showed that the output of gonadotropins and oestrogens was above normal, but not enough to be regarded as a positive response to the Friedman test. In the authors' opinion, in the absence of pregnancy or abnormality of the pituitary or ovary, this increased hormonal output must be attributed to the influence of the psyche on the endocrine system. Further support to this hypothesis is given by the fact that when each patient was told definitely that she was not pregnant, there occurred a recession of the physical signs and menstruation recommenced, and this was attended by a return to normal hormonal titres.

Pain of Organic Disease Relieved by Prefrontal Lobotomy.

WALTER FREEMAN AND JAMES W. WATTS (*The Lancet*, June 29, 1946), in performing some 400 operations by prefrontal lobotomy, have noticed the disappearance of pain; especially notable was the disappearance of what they term mental pain. This work was done on patients suffering from mental disorders. They now report their experiences with prefrontal lobotomy in the relief of pain produced by organic disease. Five cases are reported in which patients suffered from recurrent carcinoma, *tabes dorsalis*, thalamic syndrome, trauma to the *cauda equina*, and hysterical contractures in an arthritic. The patient with tabes retained a keen perception of pain, but his reaction to the pain of his tabetic crises lacked the emotional component which had previously been so disabling. None of the patients required narcotics after the lobotomy. The writers consider that intolerable pain from an organic source may be less

distressing than the fear of the pain, in which case prefrontal lobotomy is desirable; this operation alters the subject's reaction to pain without materially changing his ability to feel it.

A Study of the Brain in Experimentally Induced Acidosis.

W. F. WINDLE, H. KOENIG AND A. V. JENSEN (*Archives of Neurology and Psychiatry*, October, 1946) have made a histological study of the brain in experimentally induced acidosis. It has been shown that lowering of the pH of the blood leads to impairment of excitability of the nervous system to electrical stimulation. The greatest reductions in excitability occur in reflex arcs. Motor nuclei and peripheral motor nerves undergo the least reductions in excitability in extreme acidosis. The author has attempted to study the effects of acidosis on the cytological structure of the nervous system. Guinea-pigs were given a solution of ammonium chloride by stomach tube every day over varying periods of time to induce chronic acidosis. No cytological changes were observed in the brain. Other animals were made acutely and extremely acidotic by administering to them a lactate buffer or by subjecting them to atmospheres of 30% carbon dioxide in oxygen. No structural changes could be seen in the nerve cells of the acidotic animals given the buffer solution, although the neurones of the animals breathing carbon dioxide stained more darkly than did those of controls. When administration of ammonium chloride resulted in coma associated with acute haemorrhagic pulmonary oedema, nerve cells of the brain showed pathological alterations which were identifiable as phenomena of asphyxia.

The Causes of Death in an Acute Psychopathic Hospital.

L. MADOW AND J. STOUFFER (*The American Journal of the Medical Sciences*, October, 1946) have analysed the incidence and causes of death in the psychopathic department of the Philadelphia Hospital. Of 3,374 patients admitted in one year, 322 died. Senile patients numbered 827, and 231 of them died. Of 2,547 non-senile patients, 101 died. The commonest cause among these was cardio-vascular disease. Alcoholism and general paresis were about equal as the next commonest causes of death. Ten per centum died from "agitation" of unknown aetiology. Tuberculosis and neoplasm, both primary in the brain and metastatic, were next in frequency.

OBSTETRICS.

Semen Analysis in Sterile Marriage.

J. MACLEOD AND R. S. HOTCHKISS (*American Journal of Obstetrics and Gynecology*, July, 1946) report the results of the semen examinations of the husbands of 1,500 women undergoing investigation for sterility. They agree that the potential fertility should be judged on a broad basis with full consideration of the count, motility and morphology of the cells. In this series in about 50% of cases there were deficiencies in spermatozoa count, in motility or in morphology, and as the count fell below 60 million per millilitre so did the other defects become more

apparent. When pregnancy occurred the spermatozoa count was consistently in the higher bracket. The authors suggest the figure of 60 million spermatozoa per millilitre as a reasonable dividing line between good and impaired fertility.

Intrapartum Fever: A Preliminary Study.

L. D. ODELL AND E. D. PLASE (*American Journal of Obstetrics and Gynecology*, July, 1946) report 187 cases in which the intrapartum temperature rose to 100.4° F., an incidence of 1.2% or one in 85 deliveries. The rise in temperature may be due to dehydration, extragenital disease or birth canal infection. In genital tract infections the lesion is primarily a placentalis whose sequelæ are maternal puerperal infection and fetal aspiration pneumonia, and septicæmia by direct extension into the placental vessels. Of the 187 cases there was in 129 evidence of birth canal infection above or in combination with an extragenital factor; of these, eight mothers and sixty-one infants died—a mortality rate of 6.2 per centum and 46.9 per centum respectively. Fever when present is commonly accompanied by chills, malaise and other toxic manifestations. Uterine inertia is usually present; the uterus may rarely be tender and tense from gas accumulation, and percussion over the fundus may elicit tympany. The therapy of intrapartum birth canal infections has been significantly and favourably altered by the recognition of the dangers involved and by the use of the newer antibiotics, the sulphonamides and penicillin, both prophylactically and curatively to the mother and fetus.

DERMATOLOGY.

Treatment of Lupus Vulgaris with Calciferol.

G. B. DOWLING AND E. W. PROSSER THOMAS (*The British Journal of Dermatology and Syphilis*, March-April, 1946) review thirty-eight cases of *lupus vulgaris* in which treatment was carried out by calciferol given by mouth. The maximum dose was 150,000 international units daily, this being the highest dose that most patients appeared to be able to take without feeling sick; the dose was reduced after varying periods to 100,000 or 50,000 international units daily. The drug used throughout was the "Glaxo" product "Ostelin", which is put up in tablets each containing 50,000 international units. On the dosage prescribed few patients showed any sign of intolerance, and those who did were able to take the lower dose without any discomfort. With one exception all were long-standing cases; in many of them local treatment had been used, chiefly with Finsen or Kromayer light, liquid acid nitrate of mercury, or "Eulykol". In most of the cases of longest duration scarring from past X-ray treatment was present. Some patients continued to receive local treatment in addition to calciferol by mouth. Of the cases in which it was possible to assess results, fortunately the majority, all the patients appeared to have improved, though in a few instances no very striking change had taken place; in the majority the lupus has regressed to a remarkable degree, sometimes to the point of disappearance.

British Medical Association News.

NOTICE.

THE General Secretary of the Federal Council of the British Medical Association in Australia has announced that the following medical practitioners have been released from full-time duty with His Majesty's Forces and have resumed civil practice as from the dates mentioned:

Dr. K. J. Fagan, 131, Macquarie Street, Sydney (December 8, 1946).

Dr. K. A. McGarrity, 215, Macquarie Street, Sydney (September 23, 1946).

Medical Societies.

MELBOURNE PÄEDIATRIC SOCIETY.

A MEETING of the Melbourne Pädiatric Society was held at the Children's Hospital, Melbourne, on July 10, 1946, Dr. A. P. DERHAM, the President, in the chair.

Purulent Meningitis in Early Infancy.

DR. ELIZABETH TURNER showed four babies suffering from purulent meningitis contracted under the age of four months, who had been treated at the Children's Hospital in 1945. Dr. Turner said that many people still believed that such cases as these were hardly worth the effort entailed in treatment, especially because of the frequency and severity of the sequelæ that followed damage to the nervous system. She had been amazed at the extraordinary recuperative powers of the infant and the absence of sequelæ, even after severe and prolonged meningitis necessitating multiple lumbar punctures and even cisternal and ventricular punctures as well as intrathecal injections. Dr. Turner went on to say that in any medical subject it was unwise to dogmatize, because there were exceptions to all rules; but it was probably not unreasonable to make a few general statements with regard to the development of sequelæ, even if only to promote discussion and criticism. She felt confident that the development of sequelæ in any case of purulent meningitis in infancy or childhood was attributable to two factors—late diagnosis and inefficient therapy. This statement required qualification. With regard to the diagnosis, the onus was not entirely on the medical man. It was necessary for the parent, nurse or guardian to recognize that the child was ill and to seek medical advice promptly. However, if the child was brought to the doctor within the first twenty-four or thirty-six hours of illness, the onus did rest on the physician to establish the diagnosis and act accordingly. The secret of successful treatment in any case of meningitis was early diagnosis. With regard to efficient therapy, this presupposed that means of adequate therapy were at hand. This would apply to meningooccal, pneumococcal, streptococcal, staphylococcal and influenzal forms of meningitis, in which the infection was predominantly meningeal and not secondary to other serious conditions such as cerebral abscess, compound fracture of the skull or mastoiditis.

Dr. Turner's first patient was a female baby, aged fifteen months, who had been admitted to hospital on June 4, 1945, at the age of seven weeks. Seven days previously she had developed what appeared to be a "cold"; but two days later she had frank tonsillitis, and it was noticed that her fontanelle was bulging, and that she was pale and listless. A convulsive seizure occurred soon after this. A lumbar puncture was carried out, and the cerebro-spinal fluid was found to contain 1,500 polymorphonuclear leucocytes per cubic millimetre. *Streptococcus viridans* was grown on culture from the cerebro-spinal fluid and also from a swab taken from the throat. Twenty thousand units of penicillin were injected into the spinal theca at the first lumbar puncture. Soon afterwards a left ventricular puncture was performed. The ventricular fluid contained 2,000 polymorphonuclear leucocytes per cubic millimetre, and a further 20,000 units of penicillin were injected at this site. Twenty thousand units of penicillin were injected intrathecally each day for the next twenty-two days. Five thousand units of penicillin were given intramuscularly every three hours for the same period. Sulphamerazine (two grammes per day) was given for five and a half weeks. Heparin (0.5 millilitre) was given intrathecally on three occasions. On the eighth day a transfusion of five ounces of blood was also given. The final lumbar puncture was carried out on

the fifty-first day. The cerebro-spinal fluid contained twenty cells per cubic millimetre, of which six were polymorphonuclear leucocytes and fourteen lymphocytes. The child was discharged home on the fifty-second day. Breast feeding had been maintained throughout, and the baby had gained eighteen ounces in weight during her stay in hospital. At the time of the meeting she was enjoying good health.

Dr. Turner's second patient was a female baby, aged ten months, who had been admitted to hospital at the age of two months with a history of diarrhoea and vomiting of twelve hours' duration. On examination of the baby, the temperature was 104.2° F. The fontanelle was bulging, and considerable neck stiffness was present. At lumbar puncture the cerebro-spinal fluid was found to be turbid, and contained numerous polymorphonuclear leucocytes and organisms resembling pneumococci. On culture these proved to be pneumococcus type IV. Penicillin was given intramuscularly (5,000 units every three hours for twenty days) and intrathecally (20,000 units per day for ten days). Its intrathecal administration was then withheld for two days. However, a relapse occurred. This was manifested by a rise in temperature and an increase in the number of cells in the cerebro-spinal fluid from 153 to 2,170 per cubic millimetre. These were predominantly polymorphonuclear leucocytes. Twenty thousand units of penicillin were given intrathecally for the next two days, and then on every alternate day for four more injections. Sulphamerazine (two grammes) was given every day for twenty-six days. The cerebro-spinal fluid on the thirty-fourth day contained twelve per cubic millimetre, of which the majority were lymphocytes and the remainder polymorphonuclear cells. She was discharged home on the fortieth day. Breast feeding had been maintained throughout, and the baby had gained 34 ounces in weight during the period in hospital. Her condition at the time of the meeting was satisfactory.

Dr. Turner's third patient was a female child, aged eleven months, who had been admitted to hospital at the age of four months with a history of feverishness and drowsiness of two days' duration. On examination of the child, her temperature was 104.2° F. She was pale and listless and resented movement. At lumbar puncture the cerebro-spinal fluid was found to contain 2,340 cells per cubic millimetre, all of which were polymorphonuclear leucocytes. The sugar content of the cerebro-spinal fluid was less than 10 milligrammes per 100 millilitres. A growth of *Hæmophilus influenzae* type B was obtained on culture from the cerebro-spinal fluid. Twenty thousand units of penicillin were given intrathecally on her admission to hospital, and two grammes of sulphamerazine were administered daily. On the day after her admission to hospital 120 millilitres of *Hæmophilus influenzae* antiserum were given intravenously by the continuous drip method. On the third day after her admission to hospital, 420 polymorphonuclear leucocytes were counted per cubic millimetre of cerebro-spinal fluid, and the sugar content of the fluid had risen to forty-five milligrammes. On the sixteenth day there were only three lymphocytes per cubic millimetre of cerebro-spinal fluid, and the sugar content had remained unchanged. The child was discharged home on the twenty-first day. She had lost twenty ounces in weight during her stay in hospital. She had been artificially fed on a cow's milk mixture. Her condition at the time of the meeting was normal.

Dr. Turner's fourth patient was a male infant, aged twelve months, who had been admitted to hospital at the age of four months with a history of vomiting and diarrhoea of three weeks' duration. He had been referred to the hospital with the diagnosis of pyloric stenosis, because of the projectile nature of the vomiting. On examination, the baby was pale and wasted. His temperature was 100.4° F. Obvious head retraction, bulging of the fontanelle and nystagmus were present. The diagnosis of post-basic meningitis with hydrocephalus was made. At lumbar puncture numerous polymorphonuclear leucocytes were seen in the cerebro-spinal fluid, as well as typical meningococci. Meningococci were also grown on culture from the cerebro-spinal fluid. He was given penicillin intramuscularly, 5,000 units every three hours. Penicillin was also given intrathecally, 20,000 units per day for eleven days. Two grammes of sulphamerazine were given each day for four weeks. Heparin (0.5 millilitre) was given intrathecally every alternate day for nineteen days. On the twelfth day an increase in size of five-eighths of an inch was appreciable on measurement of the child's head. He was discharged home on the fifty-sixth day. He had been artificially fed, and had gained thirty ounces during his stay in hospital. His condition at the time of the meeting was satisfactory.

DR. J. W. GRIEVE congratulated Dr. Turner on an excellent series of cases. He said that the four babies appeared to be better behaved than ordinary babies. Dr. Grieve said that he had seen some of the patients on their admission to

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hospital. They were extremely ill, and in the old days he would have had no hesitation in saying that their chances of recovery were negligible. The results obtained in this series were an encouragement to persist with this form of treatment.

DR. HOWARD WILLIAMS also offered his congratulations to Dr. Turner. He recalled an infant, aged three months, whose condition resembled that of the baby with post-basic meningitis. This baby also had meningococcal meningitis. The fontanelle was bulging and the sutures were separating. This was in 1939, and the baby was treated with sulphapyridine in ordinary dosage, approximately 1·5 grammes per day. The head measurements increased from 15·25 to 17·25 inches within a short time. A hopeless prognosis was given; but the child recovered satisfactorily, and at the age of eighteen months his head was of normal circumference. In both cases the infection was of a low-grade type and the obstructive element was predominant. The same result had followed intensive therapy and moderate dosage.

DR. H. BOYD GRAHAM said that it was interesting to compare the post-war impression with the pre-war impression. Before the war it was considered satisfactory to save 50% of these patients from death without saying anything about sequelae. It was gratifying to see the wonderful results in Dr. Turner's series of cases.

DR. ROBERT SOUTHBY spoke on the point made by Dr. Turner on the importance of early diagnosis. In the case of young babies suspected of suffering from meningitis, who were obviously ill and feverish, and on examination of whose throat, ears and urine, negative findings were obtained, lumbar puncture was as essential and as urgent to establish the diagnosis as the taking of a catheter specimen in suspected cases of urinary infection. A striking feature of these four cases was the absence of convulsions at the onset of the illness. Dr. Southby said that he was also struck by the amount of mechanical interference that these babies could stand, including ventricular puncture, cisternal puncture and repeated lumbar punctures. He was also gratified at the absence of sequelae. It should be noted also that the first two babies, although under intensive treatment for at least seven weeks, were maintained on breast feeding. It must have been necessary to express the milk from the breast at one stage of the illness. The maintenance of breast feeding under such conditions was a good achievement.

DR. W. W. McLAREN said that the results were amazing to the older physicians. He supported Dr. Southby's remarks and stressed the importance of early diagnosis. The policy then was to hit as hard as possible in every way. It would have enhanced the value of early diagnosis to have seen two other children in whose case the diagnosis was missed because lumbar puncture was not carried out. One child had increasing hydrocephalus and the other was totally blind. Dr. McLaren asked Dr. Turner whether she always had penicillin ready at hand to inject after a positive result on lumbar puncture. He asked also whether any reactions followed large doses of penicillin given intrathecally.

DR. MOSTYN POWELL said that in the army they had been advised not to use penicillin intrathecally until the middle of 1945. The product was apparently not pure enough; but in August, 1945, it was suggested that penicillin was sufficiently purified to warrant use by that route.

DR. JEAN MACNAMARA congratulated Dr. Turner on the amazing results and supported the other speakers. She recalled a child under the age of twelve months who had contracted in 1932 cerebro-spinal fever. The patient was treated by the energetic withdrawal of large amounts of cerebro-spinal fluid. Everybody was thrilled when the child recovered; but she became deaf and dumb. Dr. Macnamara had searched through the records dealing with the 1916 epidemic. She noted that no child under the age of twelve months had survived. In New York in 1932 a baby suffering from influenzal meningitis had been saved at the Rockefeller Foundation. This had occasioned great amazement.

DR. WARWICK SMITHERS, in answer to Dr. McLaren's question, said that penicillin had been used intrathecally in the case of an airman who had been brought in unconscious. Dr. Smithers had not dared to withhold the drug in such a case. The patient had received 10,000 units without any reactions, and the next day he sat up in bed reading his paper. He proved to be suffering from cerebro-spinal meningitis. No harm whatever followed the intrathecal administration of the drug. Penicillin had been given intrathecally to other patients with good results and with no untoward effects. Dr. Smithers asked Dr. Turner whether she thought it was necessary to give such large doses of penicillin intrathecally. Satisfactory results had been obtained even with sulphapyridine. He asked also why she was using sulphaemerazine, and whether it was better than

sulphadiazine for meningitis. He doubted this. He asked finally whether she had met with any renal complications following the use of the sulphonamide drugs.

DR. JOHN COLEBATCH offered his congratulations to Dr. Turner on her series of cases, and also on her paper, which had been published in THE MEDICAL JOURNAL OF AUSTRALIA of January 5, 1946. The cases were very stimulating. Dr. Colebatch was confused with regard to dosage, and wondered whether such large doses were necessary. In the services the doses recommended fluctuated. At first small doses of penicillin were suggested; but later larger doses were recommended, and the tendency was to push the dosage to heights of 30,000 or 50,000 units in meningococcal and pneumococcal meningitis. It seemed to him that smaller doses would be adequate for infants, and he asked what was the justification for the large doses used in this series. With regard to the child with post-basic meningitis, Dr. Colebatch thought that intraventricular puncture might have been beneficial. He asked whether Dr. Turner thought this procedure was desirable.

DR. IAN WOOD said that in the early days penicillin was not diluted enough and caused reactions when given intrathecally. With dilution of the original product very little reaction was met with, and now with further purification of the drug no reaction was to be expected and it could be given with impunity. It was preferably given by the lumbar route, but if spinal block was apparent it should be given intraventricularly. Dr. Wood thought that intramuscular therapy should be maintained as well. He wondered if heparin was necessary, and for how long it was effective. He thought it would be of interest that in Boston and Montreal he had seen babies suffering from influenzal and streptococcal meningitis treated with streptomycin. Serum had been given along with streptomycin, and good results appeared to follow, although it was as yet too early to say. Dr. Wood said that when he was a resident medical officer at Great Ormond Street Hospital for Sick Children, a baby was sent into his ward with a provisional diagnosis of a dietic disorder. He obtained a history from the mother that the onset was sudden with drowsiness and refusal of breast feeding. Dr. J. W. Grieve had taught him that such a syndrome in young babies should rouse suspicion of meningitis, so he carried out a lumbar puncture and found turbid fluid. When the attending physician arrived in the ward he wondered why sulphadiazine had been ordered for a feeding disorder, and never discovered how the diagnosis of meningitis had been reached.

DR. A. P. DERHAM said that it was gratifying to notice that Dr. Turner's work on the subject of meningitis in infancy had received recognition in the 1945 edition of the "Year Book of Pediatrics". He agreed that early lumbar puncture was necessary. A baby had been admitted to his ward suffering from pneumonia. He had refrained from performing lumbar puncture for four days, when this procedure revealed the presence of influenzal meningitis as well. Dr. Derham said that he had a book dealing with the 1916 epidemic. Repeated lumbar puncture and the administration of hexamine had been the treatment employed. Two colleagues died during this epidemic, one of whom was Rothera. Later anti-menengococcal serum was the treatment of choice. This was antibacterial in action. Later still, Parke, Davis and Company introduced an antitoxic serum with more favourable results. This antitoxic serum and sulphapyridine were soon combined to give better results in cerebro-spinal meningitis. The introduction of penicillin had further enhanced the chances of recovery from these grave diseases. Dr. Derham said that in the "dark ages" the prognosis in influenzal meningitis was very poor indeed. The advances that had been made were epoch-making, as had been demonstrated by Dr. Turner's work.

Dr. Turner, in reply, thanked the various speakers for their remarks. In answer to Dr. Southby, Dr. Turner said that when the children were admitted to hospital they were turning away from the breast and vomiting. The mothers were accommodated at the hospital also. Breast milk was expressed at first, but within a few days the baby was put back on to direct breast feeding. In some cases the shock the mother sustained interfered with the breast supply; but in most cases the babies were sent home fully breast fed. This had been of great benefit. The advantages of early lumbar puncture in these cases could not be over-estimated, and as Dr. Southby had said, the procedure was just as essential as the taking of a catheter specimen of urine to detect pyelitis. Lumbar puncture was not fraught with the difficulties mentioned in the textbooks, and no ill-effect had followed in the large series of cases of meningitis. In reply to Dr. McLaren, Dr. Turner said that if lumbar puncture disclosed turbid cerebro-spinal fluid, it was the practice to inject penicillin immediately without determining the type of organism present. In these cases hours and half-

hours counted. Penicillin was injected in this way in the casualty department before the child was transferred to the ward. Penicillin did seem to be of benefit in cases of influenzal meningitis. With regard to the reaction of the theca to penicillin injections, Dr. Turner said that she had noted that some reaction occurred when the drug was first used. This was probably from impurities present. The reaction was polymorphonuclear and lymphocytic. More recently no reactions had been met with, although she had given 100,000 units in two millilitres of solution. Large doses intramuscularly supplemented intrathecal administration. In answer to Dr. Smithers, Dr. Turner said that in the series under discussion results had been comparable when sulphamerazine and sulphadiazine were used. Under treatment with sulphadiazine, several children had developed haematuria; but this had not occurred with sulphamerazine. Routine alkali treatment had been given at the same time. Sulphamerazine had been selected because of the less frequent doses necessary. The children were drowsy, and it was difficult to give four-hourly doses of sulphadiazine. In reply to Dr. Colebatch, Dr. Turner said that intraventricular puncture had been carried out and heparin as well as penicillin had been given by the intraventricular route. In reply to Dr. Wood, Dr. Turner said that heparin had been given empirically on the basis of the work of Alexander in America. The general opinion was that it did help, but it was difficult to be absolutely sure.

Naval, Military and Air Force.

APPOINTMENTS.

THE undermentioned appointments, changes *et cetera* have been promulgated in the *Commonwealth of Australia Gazette*, Number 239, of December 19, 1946.

ROYAL AUSTRALIAN AIR FORCE. Citizen Air Force: Medical Branch.

The following Flight Lieutenants are called up from the Reserve to the Active List for full-time duties with effect from the dates indicated: R. Collin (266787), 6th August, 1944, C. W. Whitelaw (267410), 23rd November, 1944, R. A. Russell (287441), 19th March, 1945, A. W. Burnell (287456), 23rd March, 1945, L. P. Comino (277539), 17th June, 1945.

The probationary appointments of the following Flight Lieutenants are confirmed with effect from the dates indicated: R. Collin (266787), 6th February, 1945, C. W. Whitelaw (267410), 23rd May, 1945, R. A. Russell (287441), 19th September, 1945, A. W. Burnell (287456), 23rd September, 1945, L. P. Comino (277539), 17th December, 1945.

The appointment of Flight Lieutenant J. V. Vaughan (257698) is terminated on demobilization with effect from 25th November, 1946.

Reserve: Medical Branch.

Rowland Anthony Godfrey-Smith (257579) is appointed to a commission with the rank of Flight Lieutenant with effect from 20th November, 1946.—(Ex. Min. No. 289—Approved 18th December, 1946.)

Post-Graduate Work.

COURSES FOR MEDICAL GRADUATES AT MELBOURNE DURING 1947.

THE Melbourne Permanent Post-Graduate Committee announces that the following courses for medical graduates will be held during 1947. Particulars may be obtained from the Secretary of the Committee at the Royal Australasian College of Surgeons Building, Spring Street, Melbourne (telephones: JM 1547 and JM 1548), unless other directions are given. Early application is advised for any of these courses. This should be accompanied by the fee, or in the case of ex-service medical officers, by information as to their entitlement under the Commonwealth Reconstruction Training Scheme. A ruling has been given that tuition fees for courses other than those for higher qualifications are allowable income tax deductions. Medical officers released from the services who are prepared to devote a certain period to full-time refresher training, and those who have resumed or entered practice or medical positions since their discharge, are entitled under the Commonwealth Reconstruction Training Scheme to certain financial

assistance towards any form of post-graduate or refresher training, at least until the end of 1947, provided application is made before June 30, 1947, or within twelve months from the date of discharge, whichever is the later. The courses included in the present programme are covered under the various entitlements.

Continuous Refresher Courses.

Commencing on February 3, continuous whole-day refresher courses will be conducted until May 30, 1947. The course is designed to cover broadly the common conditions of general medical practice. The class will be limited to twenty, and priority will be given to medical officers discharged from the services; but it is expected that there will be vacancies for others. Provided there is a vacancy, it is suitable to enter the class at any time, for one, two or more weeks if desired, up to two months. The fee for the course is two and a half guineas per week.

Intensive Refresher Courses.

A general refresher course will be conducted at various clinical schools on each day of two weeks during August, to coincide with the expected visit of an overseas lecturer. The class will be limited to twenty, and the fee will be ten guineas.

A refresher course in gynaecology and obstetrics will be conducted at the Women's Hospital during two weeks in October. The late date is made necessary by the longer period of undergraduate teaching at the hospital consequent on the post-war elongation of the medical course. The class will be limited to twenty, and the fee will be ten guineas, and £5 for residence.

Late Afternoon Courses.

Throughout the year a series of courses dealing with conditions encountered in general practice will be conducted at the Medical Society Hall, Albert Street, East Melbourne, at 4.30 p.m.

Course in Tumours of the Skin and Subcutaneous Tissues.

Dr. R. Kaye Scott has arranged a course, primarily designed for dermatologists, to be given from March 2 to March 15, on four days a week, from 4.30 to 6 p.m. and from 7.30 to 9 p.m. The subjects will include tumours of the skin and subcutaneous tissue, with special reference to their treatment by radiation therapy. Brief clinical descriptions of the conditions will be presented, and practical pathological demonstrations of the diseases discussed will be arranged by members of the Department of Pathology of the University of Melbourne.

A preliminary course of four or five lectures in radiation physics will be given by the staff of the Commonwealth X-Ray and Radium Laboratory. In the general lectures attention will be paid to techniques of radiation treatment, with special reference to complications arising during treatment.

The fee for the course will be eight guineas.

Country Courses.

A series of country courses will be conducted throughout the year. They will be available to all medical practitioners. The places and dates of the courses are as follows: Ballarat, February 22 and 23; Sale, April 12 and 13; Bendigo, June 21 and 22; Mildura, August 9 and 10; Horsham, October 11 and 12; Hamilton, November 22 and 23. The fees for each of these courses will be two guineas. A course of lecture-demonstrations will be conducted at the Geelong Hospital from April to November at 8.30 p.m., probably on the third Wednesday of each month. Details will be published later, and the fee for this course will be four guineas.

Applications for country courses should be made to the secretary of the particular subdivision of the Victorian Branch of the British Medical Association.

Courses for Higher Degrees and Diplomas.

Commencing on approximately March 12, and continuing each Wednesday and Friday afternoon until the end of July, courses will be conducted at the Departments of Anatomy, Physiology and Pathology of the University of Melbourne, designed for candidates for Part I of the examinations for the degrees of M.D. and M.S. and for the D.G.O., D.L.O., D.O., D.D.R., D.T.R.E., D.A. and D.P.M. The holding of each of these courses is contingent upon at least five candidates entering for the course. Final details will be available early in 1947. The fee for each course is thirty guineas.

A course for candidates for Part II of the examinations for the M.D. degree and for the diploma of M.R.A.C.P. will

commence in approximately the middle of February. Courses for Part II of the M.S. and F.R.A.C.S. examinations will be conducted by the Royal Australasian College of Surgeons, and particulars may be obtained from the Secretary of the College, Spring Street, C.I. (telephone: JA 2002). These courses will be held only if a minimum of five candidates enrol.

Overseas Lecturers.

It is expected that an overseas lecturer in medicine will conduct a course of six lectures during August. Details of this course will be widely published at a later date.

In conjunction with the British Medical Association and members of the Royal College of Obstetricians and Gynaecologists, arrangements have been made for Sir William Fletcher Shaw, F.R.C.P., F.R.C.O.G., F.A.C.S., to deliver two lectures, as follows: February 5, "The Historical Development of Obstetrics and Gynaecology"; February 12, "The Manchester Operation". The lectures will be given at 8.15 p.m. in the lecture theatre of the Royal Australasian College of Surgeons. There will be no charge for attendance, but the Melbourne Permanent Post-Graduate Committee will be glad to receive notification from those who intend to be present.

Film Afternoons.

As soon as a series of suitable medical films is available, it is proposed to conduct regular film sessions. Due notification will be given.

Supernumerary Residentships.

Supernumerary residents may be arranged for short periods at the various clinical schools on application to the director. Priority will be given to medical officers released from the services.

Individual Post-Graduate Clinical Study.

With due notice, individual post-graduate clinical study can be arranged to meet individual needs. A small enrolment fee is charged, according to the type of study required.

Correspondence.

HOSPITAL SERVICES, QUEENSLAND.

SIR: I should be obliged if you would correct certain misstatements attributed to Dr. A. E. Lee at the recent meeting of the Federal Council (*vide* page 878, THE MEDICAL JOURNAL OF AUSTRALIA, December 21, 1946), and permit me to offer certain comments thereon.

I shall deal with a personal matter first, not because it is the most important, but for the sake of convenience in writing this letter. Quoting from the report referred to above—"The Dean of the Faculty of Medicine who was not at present a practising doctor"—this is incorrect. Although an officer of the University of Queensland since the inception of the Faculty and Dean since 1942, I have always had the right of private practice, and my name appears in the current lists of medical practitioners and specialists.

As may be seen in the latest *Hospitals Acts* (the *Hospitals Acts*, 1936 to 1944), there is no "Conjoint Board" as stated by Dr. Lee. It is laid down in the Amendment of Section 5 of the Principal Act that: "The Director-General in making his investigation and preparing his report (to the governing body of the hospital) shall be assisted by two representatives each of the Senate of the University of Queensland and of the governing body of such hospital." Sometimes the Director-General meets each set of representatives together, and at other times he seeks separately the advice of individual representatives.

The function of the Senate representatives has been for the most part to advise the Director-General on academic qualifications, teaching ability, and research experience of the candidate for appointment. These matters come within the purview of both the Faculty of Medicine and the Professorial Board. They are of importance to the university as quite a number of the visiting medical staff are offered positions as clinical teachers in the Faculty of Medicine. The so-called "Professor of English" is President of the Professorial Board and Professor of Modern Languages and Literature.

I am concerned at the moment with the correction of misstatements, since, as a general rule, misstatements do only harm. I do not wish to enter into a discussion on the wisdom or otherwise of the method of selection of the

visiting staff to the hospital as set out in the present *Hospitals Acts*, but may I conclude by quoting "*Quis custodiet ipsos custodes?*"

Yours, etc.,
E. S. MEYERS.

639, New Sandgate Road,
Clayfield,
Queensland.
December 20, 1946.

THE TREATMENT OF THYREOTOXICOSIS BY CONCURRENT ADMINISTRATION OF THIOURACIL AND IODINE.

SIR: You are to be congratulated upon the publication in your issue of December 7 of several papers dealing with the treatment of thyrotoxicosis with "thio" drugs. The contribution of Maxwell, Gunter and Schwarz is particularly impressive because the authors have used the scientific method of thought, have given their facts clearly and have reached conclusions uninfluenced by personal prejudices. The contributions from Poate and Ritchie were written for a special occasion, but it is to be hoped that these authors will find time to set out in full the data upon which they have based their opinions so that these can be checked by other workers in this field.

It is a pity that these last two authors did not emphasize even more emphatically the dangers which attend the unskilled use of this group of drugs, because at least one reputable drug house is advertising thiothiouacil for general sale. I regard this as a singularly unfortunate action in view of our inadequate knowledge of its value and its dangers.

I am not biased against the use of thiothiouacil. In point of fact, shortly after the publication of Astwood's original paper, I obtained some thiothiouacil, and, being less bold than Mr. Poate, gave this to the Royal Melbourne Hospital so that some of my medical colleagues might use it. I felt, rightly or wrongly, that skilled physicians assisted by biochemists and other laboratory workers were better qualified to assess the value of the drug than I, and so it came about that the team led by Dr. Ivan Maxwell began its work.

But this ideal state of affairs did not last very long. Supplies of the drug found their way into less skilled hands and I soon became aware of deaths following its use. I also encountered a number of patients who had suffered from severe toxic reactions or had failed to respond satisfactorily to the drug. It is difficult to arrive at an accurate estimate of the death rate due to thiothiouacil because of the natural reticence on the part of some of those responsible for it. It appears that, even in skilled hands, the death rate is 0.5% and that, in addition, 10% of the patients treated developed toxic reactions.

These figures compare unfavourably with the results of surgical treatment. My own death rate in the last thousand consecutive cases of toxic goitre was 0.3%, despite the fact that no patient was refused operation on the score of severity of the disease. An investigation of the end-results of operative treatment of severe thyrotoxicosis estimated after the lapse of four years or more, which I reported in your issue of August 20, 1938, revealed a restoration of approximately 90% to economic usefulness.

It is a little difficult to compare these figures with Mr. Poate's, because, though he speaks of permanent control in 85% of cases by the use of the drug, he suggests elsewhere that its chief value is in "primary hyperplastic thyrotoxicosis". Cases of this nature constitute 24% of the very large number of cases of thyrotoxicosis which I have treated. It is therefore not quite clear whether he means 85% of the total number of cases or of the primary hyperplastic type only.

It follows that, though it has been established that thiothiouacil and similar drugs are of value in the treatment of some cases of thyrotoxicosis, and as an adjuvant in the treatment of others, it is not justifiable, in the present state of our knowledge, to imbue the profession generally with a feeling of confidence in its use. In other words, I applaud and support the restrained conclusions published by Maxwell and his associates.

Thiothiouacil is one of the fingerposts pointing the way along the road which, we hope, will lead in the end to the discovery of a medical cure of thyrotoxicosis. There are already several of these fingerposts, and it is nice to see the enthusiasm with which Mr. Poate leaves that labelled "thiothiouacil" for that labelled "methylthiothiouacil". I hope that the time will soon come when he will be able to lay down the scalpel which he wields with such skill because

of the fact that at last he has become armed with an effective method of medical treatment.

Perhaps I have known and admired him long enough to be forgiven if I suggest that he is becoming a little "medical minded" already, for does he not first decry the use of rule-of-thumb methods and then proceed to advise the administration of a mixed vitamin preparation?

Yours, etc.,

ALAN NEWTON.

272, Domain Road,
South Yarra,
Victoria.
December 18, 1946.

SIR: In the issue of THE MEDICAL JOURNAL OF AUSTRALIA of January 4, 1947, Mr. Hugh R. G. Poate has made comments on the article entitled "The Treatment of Thyrotoxicosis by Concurrent Administration of Thiouracil and Iodine" by Maxwell, Gunter and Schwarz.

In replying to these comments, we would take the opportunity of stating that we have this in common with Mr. Poate, we are each striving to obtain the best clinical results for our patients who are suffering from thyrotoxicosis. His ideas and ours concerning the therapeutic procedures to adopt do not exactly coincide. We feel that the treatment of toxic goitre should be surgical in a much greater percentage of cases than Mr. Poate suggests.

1. In a recent contribution entitled "Modern Viewpoints in the Treatment of Thyrotoxicosis" (THE MEDICAL JOURNAL OF AUSTRALIA, December 7, 1946), Mr. Poate states (page 790): "With added experience and perhaps with improved forms of this drug (thiouracil) it seems that permanent control of the thyrotoxic factor can be achieved in 85% of cases and that operation now will be confined to some 15%." No details of treatment of patients are given in this paper, but the reader is referred to an article by Poate and Spencer entitled "Thio" Drugs in Thyrotoxicosis" (THE MEDICAL JOURNAL OF AUSTRALIA, April 13, 1946). In this paper details of treatment of 17 illustrative cases of a total of 75 are given. Of these 17 cases eight were treated by thiouracil only. After treatment for many months four of these patients, that is, 50%, are recorded as having a basal metabolic rate of well over +10%. The actual figures were +18%, +14%, +17% and +13%. Now Mr. Poate states: "In my own practice a basal metabolic rate of +10% is regarded as evidence of persisting thyrotoxicity" (THE MEDICAL JOURNAL OF AUSTRALIA, January 4, 1946). On his own evidence, when given in full detail, and using his own criterion of success, he has failed to control the thyrotoxicosis in 50% of these patients, even after months of treatment. These are the cases he has chosen as illustrative of response to treatment, so one can only assume that of the remainder of his patients probably 50% have also failed to attain the standard of improvement which he has stated is desirable. This view is further supported by the fact that though Poate and Spencer claim in this paper that "thio" drugs showed apparent control of toxicity in 60 cases of 75 treated, yet, of the seventeen illustrative cases reported in detail six had to have surgical treatment of the thyroid gland because "thio" drugs failed to control the thyrotoxicosis (these six do not include numbers X and XI who did not have prolonged medical treatment before being subjected to operation). Of two other patients it was decided to advise operation in one instance and in the other it is stated that surgery may be required. At least seven patients requiring surgical treatment (that is, over 45%) of fifteen illustrative cases is surely inconsistent with a claim of 80% successful "thio" drug treatment of toxic goitre. Now these are cases from the groups which Mr. Poate states are amenable to "thio" treatment. It is logical to assume that if Mr. Poate has so overstated the therapeutic value of "thio" drugs in this paper, it is probable that his present report which is unsupported by illustrative cases is equally misleading. This is particularly undesirable when thiouracil is available to all practitioners and so may be used indiscriminately. It is curious that Mr. Poate did not observe that the detailed figures failed to support his general optimistic conclusions. Our own results, using iodine and thiouracil concurrently, compare more than favourably with those of Poate and Spencer in their seventeen illustrative cases.

2. Turning to another aspect of Mr. Poate's paper—the use of *Thyroideum Siccum*—we feel that it is unsound physiological practice, so to depress the formation of thyroxin by excessive use of thiouracil as to necessitate the use of *Thyroideum Siccum* to restore once more the thyroxin content of the blood. Of course this occasionally may be necessary, but in general it should be avoided by suitable adjustment of the dose of thiouracil.

3. Mr. Poate apparently does not appreciate that the response to thiouracil given simultaneously with iodine is

prompt and rapid and must not be confused with the slow response of the thyroid gland to thiouracil when prolonged iodine treatment has been given for some months preceding the use of thiouracil. He does not seem to be familiar with recent communications in *The Journal of Clinical Endocrinology*.

4. Ambulatory treatment for our patients was used in only a few instances because we wished to have them under continuous observation in hospital. Such ambulatory treatment is quite applicable to patients having iodine and thiouracil therapy concurrently.

5. The time necessary for the preparation of patients using thiouracil and iodine for operation is usually 15 to 20 days, not 20 to 30 days as Mr. Poate suggests.

6. An obvious error in the text of Mr. Poate's paper is the statement that the circulating blood contains ten microgrammes of iodine. It should, of course, read the circulating blood contains ten microgrammes of iodine per 100 cubic centimetres.

7. Toxic symptoms in our series due to thiouracil were in most instances readily controlled, but we emphasized in our paper that the use of thiouracil is not without risk. Poate and Spencer had five examples of toxic reactions to "thio" drugs (including one example of agranulocytosis) in their seventeen illustrative cases.

8. We would be interested to know what, in Mr. Poate's experience, is the percentage he selects for medical treatment of all those cases of toxic goitre coming under his observation.

9. Finally, we feel that there is a danger that Mr. Poate's unduly enthusiastic report on thiouracil may increase one of the "Vulgar Errors in Regard to Goitre" (Linell, Keynes and Piercy, *British Medical Journal*, September 28, 1946) to the detriment of the community.

Yours, etc.,

IVAN MAXWELL.

61, Collins Street,

Melbourne.

SURGICAL TREATMENT OF DEAFNESS: THE FENESTRATION OPERATION FOR OTOSCLEROSIS.

SIR: I wish to protest against the attitude to foreign clinics expressed in the article and a letter published recently; this parish pump outlook is surely at variance with current Australian medical and surgical thought.

On visiting various clinics I invariably found that some technique acquired considerably helped operative work; I also met there leading men of our speciality avidly following the methods of the surgeons; surely Australia is not to be the only self-sufficient clinical school.

With regard to the fenestration operation, there is no doubt that Lempert is a past master in this particular procedure, of which he has already done several thousands. Holmgren, of Sweden, who is looked on as the originator of this operation and has practised it for three decades, remarked after watching Lempert work that he had learned more in that morning than in thirty years of his own work.

A story I heard told at a meeting of Rotarians at Valparaiso, a small town near Chicago. The local president had been very laudatory of the work done in his small town; a visitor then told of the ostrich egg which found its way into a fowl yard. The rooster, drawing the attention of the hens to the marvel, said: Now, girls, we have always been very proud of the size and quality of our eggs, but I would like you to note how much bigger and better they do eggs in other parts.

Yours, etc.,

ROBERT S. GODSALL.

Harley,
143, Macquarie Street,
Sydney.
December 18, 1946.

THE ZOOLOGICAL POSITION OF MAN.

SIR: Your correspondent, who quite rightly wishes to spare his blushes under the pseudonym of "Criticus," adopts an attitude towards Professor Burkitt's paper on "The Zoological Position of Man" strongly reminiscent of that adopted by the anti-evolutionists of nearly a century ago. In this case, however, it is the newer conceptions of genetics, statistics *et cetera* which come under fire. Also, the methods of attack—quotations of individual authors irrespective of all other evidence, dragging sentences from their context *et cetera*—are equally reminiscent of the ancient polemics.

Since "Criticus" seems to have read at least parts of one book on the subject, and may thus be considered an authority by the uninformed, I shall be glad if you would find room for a detailed reply to his remarks.

1. The title of Professor Burkitt's paper is not misleading; it discusses enough of man's relationship to other animals for the purpose of the argument and gives ample reference for those who wish to go further.

2. "Criticus" evidently does not consider Huxley's work a "masterly synthesis", but it is probably the most comprehensive modern presentation on human evolution.

3. The fact that Goldschmidt has "foreshadowed the twilight of the gene" will probably leave most biologists unmoved, and the gene where it was. Reviving the old controversy on "what is a species?" adds nothing to "Criticus's" position, for all biologists are fully aware of the difficulty of definition.

4. The use of the term "species" for the three successive stages of human evolution should be read in the light of what has just been said. This particular application is by Weidenreich, who, as Professor Burkitt warns, puts forward theories which often confuse the problem.

5. Evidence for the acquisition of speech and conceptual thought is amply given in the references quoted by Professor Burkitt.

6. The average capacity of the few known Neanderthal skulls is higher than the average of all the known modern skulls. But modern skulls range in capacity from about 800 cubic centimetres to over 2,000 cubic centimetres, and it would be easy to select a comparable range of modern skulls with an average capacity much above the Neanderthal average. No known Neanderthal skull approaches the modern maximum.

7. Variability through isolation of subspecific groups is a well-known and often observed fact. So is variability through an environmental range without isolation—this is a "cline". The fact that Goldschmidt argues against the "assumption" will convince only those who want to be convinced.

8. *Dryopithecus* may not be on the direct line of human evolution, but it is as close to that line as the present evidence permits us to judge.

9. Geneticists will be astounded to learn that by introducing the concepts of "genic balance" and "gene complex" they have tacitly abandoned the classic conception of the gene. As we will argue that chemists who use the concept of the molecule have abandoned the classic conception of the atom. And just as the substitution of one atom for another in a molecule may produce marked change in properties, so may substitution of one gene for another in a genotype produce marked change in the phenotype. The effects of single gene substitution in such animals as *Drosophila* are so well known that "Criticus's" ignorance on the subject is a matter for surprise. Despite him, the presence of a single unbalanced recessive in the proper place on the X chromosome will continue to cause haemophilia in the male.

10. Huxley probably does not pretend to an exhaustive knowledge of the possibilities of organic life, but he is certainly in a better position to express an opinion on the matter of cerebral evolution than even the "majority of philosophers", who have no practical experience of this subject. Aristotle, incidentally, does not constitute a "majority of philosophers"; he denied that the brain produces thought because he believed that the heart did the job—a necessary prop to his humoral theory. His views on the origin of thought did not survive him, and it would have been better, perhaps, not to bring the more unfortunate speculations of 300 B.C. into a scientific discussion of A.D. 1946.

11. Intrauterine competition is a fact, the freemartin is one of the more obvious results. Animals which habitually have multiple births have, generally speaking, shorter gestation periods.

12. The theory that man has evolved from an arboreal ancestor is far from being *a priori* speculation. The evidence, which Professor Burkitt surveys fairly, and to which he gives adequate reference, all points strongly to that conclusion. Hooton may have criticized this sharply, but that will not necessarily make any material alteration in our views.

13. Physical anthropology measures end results; we have plenty of such measurements and can add to them whenever we wish. The cause of these results lies, as far as can be seen, in the genes; the possibility of learning more of the cause—which is more important than the result—and the further possibility of influencing the result, which may be of profound importance, rest on further knowledge of genes.

14. Statistical methods are tools available to any branch of science. The major workers in biological statistics are

all trained biologists and do not require Goldschmidt's reminder that their biology must be sound. Conversely, statistical mistreatment of biological observations is equally dangerous.

15. Professor Burkitt remarked (page 616): "... man is continuously sexed, whereas *most* higher animals are *discontinuously sexed*." The italics are mine; had they been in the original "Criticus" may have appreciated that his reference to the monkey and donkey was unnecessary.

16. Professor Burkitt has every right to doubt the evidence for extrasensory perception, and it will have to be much more convincing than it is at present to impress anyone with a scientific outlook. Anthropological advice in the control of people has proved so successful where it has been invited and followed, for example, in New Guinea, that the advantages of extending the method should be manifest.

I may conclude by pointing out that the problem of man's evolution is one of the most difficult with which biologists have to grapple. It will not be solved easily by any one man or soon. There is room for honest workers and honest doubters in this subject which is slowly piecing together a tentative solution from a mass of fragmentary and sometimes conflicting evidence. The honest workers welcome honest criticism, particularly if it is constructive. If "Criticus" ever has anything of this sort to offer it will be equally welcome.

Yours, etc.,

A. A. ABBIE.

Department of Anatomy,
University of Adelaide,
South Australia.
December 18, 1946.

The Royal Australasian College of Surgeons.

GEORGE ADLINGTON SYME SCHOLARSHIP, 1947.

The Council of the Royal Australasian College of Surgeons invites applications for the George Adlington Syme Research Scholarship for 1947. The scholarship is valued at £50. Applicants are requested to give full details of the research work which they desire to undertake. It is preferable that the research should be clinical in nature. The successful applicant must undertake to publish in *The Australian and New Zealand Journal of Surgery* a paper recording the result of his or her work, should the Council so desire.

Any further information required may be obtained from the Secretary of the College, with whom applications must be lodged on or before February 28, 1947.

Australian Medical Board Proceedings.

NEW SOUTH WALES.

The undermentioned have been registered, pursuant to the provisions of the *Medical Practitioners Act*, 1938-1939, of New South Wales, as duly qualified medical practitioners:

Glasgow, Betty Carlisle, M.B., B.S., 1946 (Univ. Sydney), St. George District Hospital, Kogarah.

Godden, Ruth Irene, M.B., 1946 (Univ. Sydney), St. George District Hospital, Kogarah.

Grant, Alan, M.B., B.S., 1946 (Univ. Sydney), Grafton Base Hospital, New South Wales.

Greenwell, John, M.B., B.S., 1946 (Univ. Sydney), Blue Mountains District Anzac Memorial Hospital, Katoomba.

Hannam, William Henry, M.B., 1946 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.

Harney, Allan John, M.B., B.S., 1946 (Univ. Sydney), Saint Vincent's Hospital, Darlinghurst.

Hart, Vincent Anthony, M.B., B.S., 1946 (Univ. Sydney), Saint Vincent's Hospital, Darlinghurst.

Hatfield, Kenneth Daniel, M.B., B.S., 1946 (Univ. Sydney), Saint Vincent's Hospital, Darlinghurst.

Hayatt, Miles Tom, M.B., B.S., 1946 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.

Hayhow, William Russell, M.B., B.S., 1946 (Univ. Sydney), Sydney Hospital, Sydney.

Haynes, Elva Grace, M.B., B.S., 1946 (Univ. Sydney), Tamworth Base Hospital, New South Wales.

Dominations and Elections.

THE undermentioned have applied for election as members of the New South Wales Branch of the British Medical Association:

Greenwell, John, M.B., B.S., 1946 (Univ. Sydney), 145, Katoomba Street, Katoomba.
Cconomy, Albert Bruce, M.B., B.S., 1945 (Univ. Sydney), c/o Mr. C. M. C. Barling, Forest Road, Peakhurst.
Finckh, Ernest Sydney, M.B., B.S., 1946 (Univ. Sydney), 13, Wharf Road, Snail's Bay.

The undermentioned have been elected as members of the South Australian Branch of the British Medical Association:

Moore, Max Clifford, M.B., B.S., 1946 (Univ. Adelaide), 1, Bagot Avenue, Mile End.
McCann, William James, M.B., B.S., 1946 (Univ. Adelaide), Royal Adelaide Hospital, Adelaide.
Stratton, Keith Jeffrey, M.B., B.S., 1944 (Univ. Adelaide), Box 30, Booleroo Centre, South Australia.

Obituary.

DONALD IAN ROBERTSON SMITH.

We regret to announce the death of Dr. Donald Ian Robertson Smith, which occurred on January 3, 1947, at Perth.

A MEMORIAL TO THE LATE MAJOR-GENERAL RUPERT MAJOR DOWNES.

THE many friends of the late Major-General Rupert Major Downes, C.M.G., are anxious to perpetuate his memory. A committee, consisting of Sir Charles Blackburn, the Honourable Arthur E. Colvin, Dr. Arthur L. Dawson, Dr. Wilfred Evans, Dr. Alex McIntosh and Dr. William Wood, has approached officers of the Australian Army Medical Corps in New South Wales, and Dr. G. W. C. Macartney and Dr. K. B. Fraser have taken similar steps in Queensland. Sir Alan Newton, Dr. Victor Hurley, Dr. W. G. D. Upjohn and Dr. W. W. S. Johnston are communicating with the friends and brother officers of Major-General Downes living in Victoria, South Australia, Tasmania and Western Australia. The form which the memorial will take has not been definitely decided. It has been suggested that it should be a prize in some subject in which Major-General Downes was particularly interested, such as "Medical Ethics" or "The Organization and Administration of the Army Medical Corps". Any who wish to join in establishing this memorial should forward their subscriptions to Sir Alan Newton, Royal Australasian College of Surgeons, Spring Street, Melbourne. Cheques should be crossed and made payable to the "Alan Newton Trust Account".

Medical Appointments.

Dr. L. W. Jeffries has been appointed Director-General of Medical Services, Chairman, Board of Management, Royal Adelaide Hospital, Adelaide, and Chairman, Nurses' Board of South Australia, for a period of six months as from December 9, 1946.

Dr. Arthur Richard Haynes has been appointed quarantine officer at Wyndham, Western Australia, under the Quarantine Act, 1908-1924.

Dr. R. L. E. Walmsley has been appointed Admitting Officer, Royal Adelaide Hospital, Adelaide.

Dr. P. G. Hayes has been appointed medical officer of health, Quairading Road Board, Western Australia.

Books Received.

"Practical Handbook of the Pathology of the Skin: An Introduction to the Histology, Pathology, Bacteriology and Mycology of the Skin with Special Reference to Technique", by J. M. H. Macleod, M.A., M.D., F.R.C.P. (London), and I. Muende, M.R.C.P. (London), M.B., B.S., B.Sc. (London);

Third Edition; 1946. London: H. K. Lewis and Company, Limited. 9 $\frac{1}{2}$ " x 6 $\frac{1}{2}$ ", pp. 446, with many illustrations, some coloured. Price: 50s.

"Peripheral Vascular Diseases", by Edgar V. Allen, B.S., M.A., M.D., M.S. in Medicine, F.A.C.P.; Nelson W. Barker, B.A., M.D., M.S. in Medicine, F.A.C.P.; and Edgar A. Hines, junior, M.D., B.S., M.A., M.S. in Medicine, F.A.C.P.; with associates in the Mayo Clinic and Mayo Foundation; 1946. 9 $\frac{1}{2}$ " x 6 $\frac{1}{2}$ ", pp. 886, with many illustrations. Price 75s.

Diary for the Month.

JAN. 16.—Victorian Branch, B.M.A.: Executive Committee.
JAN. 21.—N.S.W. Branch, B.M.A.: Medical Politics Committee.
JAN. 22.—Victorian Branch, B.M.A.: Council Meeting.
JAN. 24.—Queensland Branch, B.M.A.: Council Meeting.
FEB. 4.—N.S.W. Branch, B.M.A.: Organization and Science Committee.
FEB. 4.—N.S.W. Branch, B.M.A.: Special Groups Committee.
FEB. 11.—N.S.W. Branch, B.M.A.: Executive and Finance Committee.
FEB. 18.—N.S.W. Branch, B.M.A.: Medical Politics Committee.
FEB. 25.—N.S.W. Branch, B.M.A.: Ethics Committee.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Honorary Secretary, 135, Macquarie Street, Sydney): Australian Natives' Association; Ashfield and District United Friendly Societies' Dispensary; Balmain United Friendly Societies' Dispensary; Leichhardt and Petersham United Friendly Societies' Dispensary; Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney; North Sydney Friendly Societies' Dispensary Limited; People's Prudential Assurance Company Limited; Phoenix Mutual Provident Society.

Victorian Branch (Honorary Secretary, Medical Society Hall, East Melbourne): Associated Medical Services Limited; all Institutes or Medical Dispensaries; Australian Prudential Association, Proprietary, Limited; Federated Mutual Medical Benefit Society; Mutual National Provident Club; National Provident Association; Hospital or other appointments outside Victoria.

Queensland Branch (Honorary Secretary, B.M.A. House, 225, Wickham Terrace, Brisbane, B.17): Brisbane Associated Friendly Societies' Medical Institute; Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

South Australian Branch (Honorary Secretary, 178, North Terrace, Adelaide): All Lodge appointments in South Australia; all Contract Practice appointments in South Australia.

Western Australian Branch (Honorary Secretary, 205, Saint George's Terrace, Perth): Wiluna Hospital; all Contract Practice appointments in Western Australia. All government appointments with the exception of those of the Department of Public Health.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

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